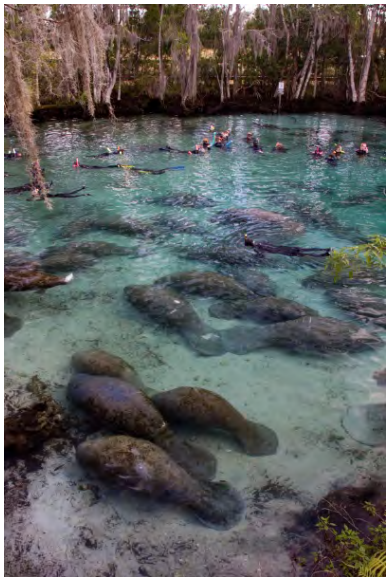
Draft Environmental Assessment

Manatee Wildlife Viewing

on

CRYSTAL RIVER NATIONAL WILDLIFE REFUGE
THREE SISTERS SPRINGS
Citrus County, Florida



For Further Information, Contact:
Refuge Manager
U. S. Fish and Wildlife Service
Crystal River National Wildlife Refuge
1502 SE Kings Bay Drive
Crystal River, Florida 34429

Prepared by:
U. S. Department of the Interior
U. S. Fish and Wildlife Service
Crystal River, Florida
December 2014

TABLE OF CONTENTS

This Draft Environmental Assessment (EA) addresses a recreational wildlife viewing activity where large numbers of snorkelers and boaters are crowded into a relatively small aquatic space to view a protected species, the Florida manatee (*Trichechus manatus latirostris)*. This activity is occurring in shallow, warm water springs (1.5 acres), known as Three Sisters Springs, which is situated on a larger property (57.1 acres) also known as Three Sisters Springs. For the purpose of this EA, we are only addressing the recreational viewing activity which occurs in the confined 1.5 acres of fresh water springs.

BACKGROUND

The 57.1-acre Three Sisters Springs property (Figure 1) was purchased through a partnership effort in July 2010 (Figure 1). This partnership included: the City of Crystal River (City); the Florida Communities Trust (FCT) [grant to the City]; Citrus County and the Citrus County Tourist Development Council; the Felburn Foundation, the Friends of Crystal River National Wildlife Refuge Complex, environmental organizations, civic clubs, and individuals; Southwest Florida Water Management District (SWFWMD); National Wildlife Refuge Association; and the U.S. Fish and Wildlife Service (Service or USFWS). Federal Land and Water Conservation Fund and Felburn Foundation funds were used to retire the water rights for the warm water springs located on the site by purchasing a privately held Consumptive Use Permit.
The 57.1-acre property is 70% owned by the City and 30% by the SWFWMD. The Crystal River National Wildlife Refuge (CRNWR), the City and the SWFWMD manage this property pursuant to the Three Sisters Springs Management Agreement (Agreement) and Management Plan (Plan). (Appendix A and B). The Service manages the property under a lease agreement with the City and SWFWMD. This Agreement lasts for 25 years and allows for two automatic 25-year extensions. The Agreement provides for the U.S. Fish and Wildlife Service to manage the entire site as part of CRNWR in accordance with (1) the Plan; (2) the National Wildlife Refuge Administration Act of 1966, as amended, 16 U.S.C. § 668dd; (3) other acts of general applicability to the National Wildlife Refuge System; (4) Title 50 of the Code of Federal Regulations (including the Kings Bay Manatee Protection Area Rule); and (5) State of Florida laws and regulations. The Agreement between the City and CRNWR describe a broad range of public use requirements.

As provided in the National Wildlife Refuge Administration Act, the Service's policy is to provide expanded opportunities for wildlife-dependent uses when compatible and consistent with sound fish and wildlife management, ensuring that such uses receive enhanced attention during planning and management. Wildlife observation is a priority wildlife-dependent use for the National Wildlife Refuge System (NWRS) through which the public can develop an appreciation for fish and wildlife (Executive Order 12996, March 25, 1996 and The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57)). The Agreement requires the Service to maintain Three Sisters Springs, including the warm water springs, open to public recreation, maintaining and sustaining quality visitor experiences while at the same time providing adequate protected areas for manatees. (For an overview of the environmental and regulatory issues surrounding manatee management in the Kings Bay vicinity see: http://www.fws.gov/northflorida/Manatee/Documents/MPARules/Mar12_KB_MPA/20111202_ea_FINAL_EA%20Kings_Bay_MPA.pdf).

Figure 1. 2009 Aerial Photo of Three Sisters Springs Property with Springs Assessment Area.

CHAPTER 1 Purpose and Need for Action

CRNWR was administratively authorized by the Director of the Service on January 10, 1983, to conserve threatened and endangered species, specifically focusing on the West Indian manatee (*Trichechus manatus*) and more specifically the subspecies Florida manatee (*Trichechus manatus latirostris)*. The primary purpose of CRNWR is to protect threatened and endangered species, with a management focus on the Florida manatee, under the Endangered Species Act:

> ... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." 16 USC §1534 (Endangered Species Act of 1973).

Secondary purposes also apply to CRNWR, as listed:

> ... suitable for...(1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 USC §460k-1 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 USC §460k-2 (Refuge Recreation Act, 16 USC §§460k-460k-4, as amended).
>
> ... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" 16 USC §3901 (B) 100 Stat.3583 (Emergency Wetlands Resources Act of 1986).

Specifically, CRNWR was established for the protection of the endangered West Indian manatee. The objectives for CRNWR include:

1. To provide habitat and protection for the West Indian manatee consistent with the requirements of the Endangered Species Act, the Marine Mammal Protection Act, and the Florida Manatee Sanctuary Act.
2. To foster a sense of public commitment and understanding toward the plight of the manatee and its need for protection by providing opportunities for environmental education, interpretation, and compatible wildlife-oriented recreation.
3. To support the Service's commitment to implement and carry out the objectives of the nationwide Manatee Recovery Plan.
4. To provide habitat for a natural diversity of wildlife species.

The purpose of this Draft Environmental Assessment (EA) is to evaluate alternatives for managing human and manatee interactions in the 1.5 acres of warm water springs located on Three Sisters Springs, given the requirements of the Agreements and Plan with the City and District, as well as the CRNWR purposes summarized above. The warm water springs consist of three spring heads/boils named Pretty Sister, Big Sister, and Little Sister in which the site derives its name (Figure 2).

With the trend of increasing human and manatee usage inside the three spring heads, there is a need to evaluate human and manatee interactions in this limited and specific assessment area to better inform management actions in the future. Recommendations for changes to manage human and manatee interactions will only apply to the three spring heads located at Three Sisters Springs.

Public Outreach

A description of the CRNWR's long-term management actions and direction is being developed in the CRNWR Comprehensive Conservation Plan (CCP) scheduled for completion in 2015. However, this EA for manatee wildlife viewing is being developed only to implement management measures/strategies to address concerns associated with increased manatee use and human crowding inside the 1.5 acres of warm water springs consisting of Pretty Sister, Big Sister, and Little Sister springs for the 2014-2015 manatee season. These interim measures (proposed action) will be evaluated, monitored, and adapted to assist in final management actions implemented under the CCP that is under development.

The alternatives and the scope of the affected environment for this EA have been informed by previous public comments and meetings for the CCP which included public meetings on February 6, 2008; November 16, 18, and 20, 2010; December 2, 2010; January 4, 2011; July 7, 2011; March 19, 2013; and July 11, 2013. For the 14-day public review of this EA, CRNWR will provide a short summary of the proposal, inform the public how and where to get additional information, and inform the public of the comment period deadline through emails, websites, public notices, and posting at the CRNWR visitor center. The final EA will be available at the CRNWR visitor center, on the CRNWR website (www.fws.gov/crystalriver), and at the public library. The reduced public comment period is allowed because of the extensive public scoping provided and the urgent need to address manatee protection during the current winter season.

CRNWR will review all comments submitted in the preparation of the final EA. As a caveat the CRNWR will continue with implementing necessary cold-weather closures outside of review and response to public comments, and the finalization of the EA.

Consultation and Coordination

CRNWR staff consulted with the USFWS's Ecological Services program in the North Florida Ecological Services Office for the Intra-Service Section 7 Consultation under the Endangered Species Act. This consultation resulted in a "not likely to adversely affect" determination (Appendix C). Additionally, between March 2014 and October 2014, CRNWR informally consulted with the City, District, Florida Fish and Wildlife Conservation Commission (FWC), USGS manatee researchers, local stakeholders, interested parties, community groups, and national and local non-government organizations.

Figure 2. Three Sisters Springs Assessment Area

Chapter 2 Alternatives Including the Proposed Action

2.1 Alternatives Considered but not Developed Further

Close the 1.5 acres of warm water springs located on Three Sisters Springs during the Manatee Season

Under this alternative, the CRNWR would close the three spring heads located on Three Sisters Springs to all public access during the manatee season (November 15 – March 31) until the CCP and associated Environmental Assessment are completed. However, this alternative would violate the Agreement and the Plan in accordance with the Declaration of Restrictive Covenants which precludes a complete closure of Three Sisters Springs.

2.2 Alternatives Considered and Developed

Two alternatives were considered and developed for this EA: (1) the No Action Alternative and (2) the Proposed Action Alternative (preferred alternative), which considers the parameters required by the Agreement and Plan in accordance with the Declaration of Restrictive Covenants (Appendix A and B) and provides protection for manatees as stated below:

> Manatee Management: The Three Sisters Springs will remain open to the public to be used for kayaking/canoeing, swimming, snorkeling and diving, subject to any restrictions that may be implemented through the provisions of the Agreement in place for the Three Sisters Springs site. In keeping with the intent of maintaining and sustaining quality visitor experiences while at the same time providing adequate protected areas for manatees, USFWS will consider using existing federal rulemaking/processes to manage for the benefit of both manatees and visitors.
>
> Public Uses: The public currently accesses the Three Sisters Springs by water, entering the springs while in the water or by kayak/canoe, primarily to view manatees. No motorized crafts, such as motorboats, jet skis, etc., will be allowed in the springs or the spring run. Management activities will include providing compatible, wildlife-oriented recreational opportunities for visitors while optimizing use of the springs for manatees. Compatible uses of the site will likely include existing in-water uses, managed to enhance visitor experiences and minimize manatee disturbance. USFWS may enact partial closure of Three Sisters Springs during the coldest winter months and would consider full closure only for extreme cold winter events. Management actions concerning the protection of manatees in the springs and adjacent areas will be made with input from the public as provided for by federal law.

In addition, both alternatives must consider the guidelines for passive wildlife observation, including the 12 prohibited actions identified in the Kings Bay Manatee Protection Area Rule (Appendix D).

2.2.1 Alternative 1 (No Action): Current Management

Under this alternative, the CRNWR would not implement any management measures under the National Wildlife Refuge Administration Act in the warm water springs located at Three Sisters Springs except for those measures identified in the Kings Bay Manatee Protection Area Rule for extreme cold weather events and violations of the 12 prohibitions and in the Agreement and Plan. (Appendix A and B).

2.2.2 Alternative 2 (Proposed Action): Create interior areas for manatees only, restrict in-water public visitation, and restrict non-motorized vessels at the warm water springs located at Three Sisters Springs during Manatee Season (Figure 3)

The proposed action would allow the Service to implement the following precautionary measures under the National Wildlife Refuge Administration Act for the 2014 – 2015 manatee season and will allow the Service the ability to avert the disturbance of manatees associated with watercraft and manatee viewing activities.

1. Continue to implement temporary full closures to prohibit visitation inside the warm water springs located at Three Sisters Springs during extreme cold weather events and violations of the 12 prohibitions identified by the Kings Bay Manatee Protection Area Rule.
2. Install an in-water, non-motorized vessel tie-up/disembarking area east of the warm water springs located at Three Sisters Springs, and prohibit vessels and large inflatable floats within the spring heads as well as the spring run in order to reduce manatee disturbance and potentially unsafe encounters with swimmers.
3. Guide the public to use the western half of the spring run extending into the warm water spring heads located at Three Sisters Spring to maintain an open channel for manatee ingress and egress.
4. Create two expanded no-public entry areas within the spring heads by closing the eastern and western lobes known as Pretty Sister and Little Sister located on Three Sisters Springs.
5. Restrict in-water visitation to the warm water springs located at Three Sisters Springs to provide manatees time to aggregate during the colder periods of the morning and late afternoon. In water visitation will be allowed from 10:00 a.m. to 5:00 p.m.
6. Require a Special Use Permit for the use of any type of flash photography inside the warm water springs at Three Sisters Springs. Special Use Permits for diffused flash photography will only be issued for educational or research purposes.
7. Amend Special Use Permit conditions for Commercial Wildlife Observation Guides using the warm water springs at Three Sisters Spring to require the following specific stipulations: a City of Crystal River business license or exemption letter, in-water insurance for their clients, and an in-water guide to accompany the clients into the Three Sisters Springs.
8. Implement an expedited communication plan to actively inform visitors and stakeholders of the proposed action.

Figure 3. Potential Management Options for the 2014-2015 Manatee Season (Proposed Action Alternative)

Chapter 3 Affected Environment

Three Sisters Springs (57.1 acres) is located within the City of Crystal River, Citrus County, Florida, at the eastern edge of Kings Bay and the headwaters of the Crystal River. It is bounded to the north by Kings Bay Drive, to the east by Cutler Spur Boulevard, and to the south and west by dredged navigational canals. The affected environment consists of the three small, second-order magnitude warm water springs located in the southwest corner of the property (Figures 1 and 2). (Appendix G)

Prior to extensive development in and around the City, the site consisted of a forested wetland system that surrounded Three Sisters Springs (Figure 4). The 1957 aerial photograph shows that the forested area within the site extended further to the south than it does presently. By 1973, a residential canal was excavated that forms the present southern boundary of the project site. Between 1973 and 1985, much of the site was cleared of native vegetation and a large borrow pond (Lake Lynda) was excavated to obtain fill material needed to raise ground elevations for future development. A residential development was planned and permitted for construction in 2008, but the property owners ultimately agreed to sell the parcel to a consortium of public agencies for environmental purposes.

Currently, the site is comprised of open space with scattered trees. A hardwood fringe surrounds the perimeter of the parcel as well as provides a buffer around the warm water spring heads or boils and run. Much of the open area has been prepared for reforestation. The CRNWR recently completed a boardwalk to provide walking access around the warm water springs located at Three Sisters Springs.

The contributing watershed sub-basin totals about 140 acres. The dominant land use in the watershed is commercial and makes up about 59 percent of the total area. About 20 acres of the site contributes runoff to the eastern drainage ditch. Two aquatic features exist on Three Sisters Springs, the natural warm water springs that occurs in the southwest corner of the site, and an excavated borrow pond locally named Lake Lynda in the northern part of the site. The lake has a surface area of approximately eight acres and has a maximum depth of about 40 feet. Man-made storm water ditches lie adjacent to the northern and eastern boundaries of the site and large navigable canals bound the southern and western property lines.

3.1 Biological Environment

The warm water springs located at Three Sisters Springs have been classified by State of Florida as a second-order spring system with three primary spring boils with interconnected pools. The warm water spring heads are situated in an entirely confined area. The three spring heads and interconnected pools are less than 1.5 acres in size, have an average depth of 6 feet, and are completely surrounded by a vegetated shoreline. It has a narrow, 8-foot wide, 165-foot long water outfall or spring run. The spring run discharges into a dredged, residential canal system with leads into Kings Bay and eventually to the Crystal River which flows into the Gulf of Mexico. The springs located at Three Sisters Springs are collectively one of only a few confined spring sites where people are allowed to swim with manatees during the winter months.

All confined springs under State-ownership in Florida are closed to public access during the winter when manatees are present.

Existing and historical overviews of the Three Sisters Springs spring shed, geology and soils, land use and land cover, general hydrology, vegetation and natural communities, and importance to Florida manatees are described in the Three Sisters Springs Project Management Plan (FCT 2010).

3.1.1 Hydrology

The principle hydrogeological feature of the property is the Upper Floridian Aquifer with limestone karst commonly located near the surface of the soil (USDA-SCS 1988). Overlaying soils are moderately sloping and somewhat poorly drained, consisting of sand, silt, and clay (USDA-SCS 1988). The site was historically part of a densely vegetated, extensive wetland system draining to Kings Bay of the Crystal River (FCT 2010). Given the nature of the hydrogeology, soils, and vegetation patterns, it is believed that this property was historically either a Mesic or Hydric Hammock natural community (FCT 2010 see FNAI 2010 for description). Aerial photography suggests that it remained in this condition until the 1970s, when the property was cleared and filled with the intent of creating a building site suitable for residential development. During this time at least two borrow pits were excavated: one approximately four acres in size formerly located on the southwestern portion which was eventually filled, and another approximately eight acres and 40 feet deep located on the northern portion of the property called Lake Lynda.

Analysis of aerial and historical photography, current site conditions, and history of land use at the site suggest that the hydrology, hydraulics, and geomorphology have changed over time. Aerial photography from 1944 – 1974 indicates that Three Sisters Springs consisted of three narrowly connected spring boils with an extensive wooded riparian zone and associated wetlands until land use clearing and filling (Figure 4). The 1974 aerial shows extensive tree clearing at the site into the riparian zone of the spring, particularly along the southern portion of the pond and spring run where trees were cleared from the banks. The current riparian tree assemblage is relatively young (30 – 40 years), suggesting that tree clearing continued throughout the rest of the riparian zone as the land was filled, and prepared for residential development. In addition, the perimeter and surface areas of the spring boils appear noticeably smaller in the pre-construction aerials of 1944 and 1951 (with the 1974 aerial better showing the morphology due to tree clearing) than in the post-construction aerials 1994 – present.

Figure 4. Historical Aerial Photographs of Three Sisters Springs 1957, 1973, 1985, respectively. (SWFMD 2012)

3.1.2 Soils and Vegetation

Soils on the Three Sisters Springs property have experienced significant disturbance in preparation for development. Lake Lynda in the center of the property was created through excavation to produce material to raise ground levels on the site. The watershed is dominated by Quartzipsamments soils which are located primarily in the developed area of the watershed east of the site. Soils underlying the project site are dominated by Matlacha soils which are disturbed soils produced from dredging and grading work. Limestone rock is prevalent on the site and obvious in many of the bedded pine rows. The bottoms of spring runs are generally sand or exposed limestone along a central, stable channel.

The perimeter of the warm water springs located at Three Sisters Springs is currently characterized by a narrow riparian zone 10–40 feet wide typically comprised of riparian trees (especially on the north and northeast perimeter) and sparse to moderately dense understory vegetation (Figure 2). The western portion (little sister) of the Three Sisters Springs has a wider riparian zone comprised of up to five trees per radial width. Site inspection identified what appear to be levees, fill material, and sporadic boulders located within the west-southwest riparian zone of the warm water springs at Three Sisters Springs. Banks along the pool and run are vertical to severely undercut, with bank angles up to 160° and undercuts reaching > 4 feet underneath some banks. Vegetation in the warm water springs at Three Sisters Springs and spring run habitats consists of submerged aquatic vegetation and aquatic algae covering limestone outcroppings. Several trees overhang the pool, in some cases with nearly entire root structure exposed with little or no connection to the pool banks.

3.1.3 Threatened, Endangered, and Protected Species

3.1.3.1 West Indian Manatee

The West Indian manatee, including the Florida and Antillean subspecies, is listed as an endangered species pursuant to the Endangered Species Act of 1973 (USFWS 2007). The State of Florida lists the Florida subspecies as an endangered species pursuant to Rules 68A-27.003 and 68A-27.005 of the Florida Administrative Code (FWC 2011). The Service designated critical habitat for the Florida subspecies in 1976; this designation includes waters in Florida, including waters in Kings Bay (USFWS 2007). The CRNWR has the responsibility to delineate the manatee sanctuary boundaries, provide volunteers to conduct education around the sanctuaries, and conduct law enforcement year-round in the Kings Bay Manatee Protection Area (KBMPA) and seven manatee sanctuaries in Kings Bay.

Florida's manatee population is primarily threatened by watercraft collisions and loss of winter warm water habitat. Other threats include red tides, cold weather, water control structures, fishing gear, and others. Significant efforts have been made by the Service and State to address these threats. In 2007, a USFWS threat analyses suggested that these efforts are improving the status of the Florida manatee (USFWS 2007). The Service is currently conducting a review of the status of the West Indian manatee (90-Day Finding on a Petition to Reclassify the West Indian Manatee and Initiation of a Status Review, 2014).

A significant habitat threat to the Florida manatee is the loss of warm water refugia at natural, warm-water springs and man-made warm water outflows from power plants. Natural springs across Florida are threatened by reductions in flow and water quality and by factors which affect manatee access and use. The 70 springs in Kings Bay constitute one of the most important natural warm water shelters for the Florida manatee. The Kings Bay springs provide refugia to hundreds of manatees during cold-weather conditions and are considered among the highest priority winter thermal retreats for the species throughout its range. Displacement of manatees from warm water springs is a cause for concern because prolonged exposure to cold water can be fatal, especially to smaller animals.

Winter manatee aggregations are driven by a single factor, cold weather. One of the greatest natural threats to manatees are the more extreme winter cold weather events that have caused mass mortalities of up to 480 manatees, such as in the winter of 2010. Most cold fronts that affect the Gulf of Mexico are mild, with air temperatures ranging from mid 50s to low 70s Fahrenheit (F). Prolonged cold events (over 24 hours) ranging from low 40s to mid 50s F, trigger high manatee aggregations in the warm water springs at Three Sisters Springs (water temperature 72° F), while events below 40° F trigger extreme manatee aggregations around the spring heads located at Three Sisters Springs. These last two ranges of cold fronts can occur frequently in November, December, January, February and March, with January having the most frequent and intense cold fronts. While some of the events do not last very long (2 -3 days), others can take about 2 weeks to move through Kings Bay. Because of the shallow depth of Kings Bay (average 8 feet), these stronger fronts can drop the water temperature significantly, leaving manatees with few warm water refugia. Another factor is successive cold spells within a short timeframe which reduce the water temperature significantly keeping manatees aggregated around the warm water springs including the spring heads located at Three Sisters Springs for days. More in depth weather information for this local area is located at: http://climatecenter.fsu.edu/images/fcc/data/lcdtables/2014TPAjan.html

Manatees have been surveyed by aerial observations in Kings Bay beginning in 1967 (Appendix E) and have shown a generally increasing population trend. Aerial surveys began in 1968 with a high count of 38 manatees in Kings Bay. Twenty years later in 1988, the population count totaled 158. In 2013, aerial surveys showed a peak of 560 manatees using Kings Bay (Kleen and Breland 2014). While aerial surveys are conducted over the Three Sisters Springs, dense canopy cover around the warm water springs does not allow for an accurate aerial survey count. However, aerial surveys over Idiot's Delight Number 1 manatee sanctuary, directly outside of the Three Sisters Springs, have recorded over 80 manatees. The same survey records over 80 manatees outside of Idiot's Delight Number 1 manatee sanctuary and Three Sisters Springs seeking warm water refugia. The photo does not reveal if the interior of Three Sisters Springs is already full of manatees, or if there are people present which may have displaced manatees.

Prior to 2010 and during low tides manatees were rarely found in the interior of the warm water springs located at Three Sisters Springs due to the presence of boulders partially blocking the spring run. Since the removal of this barrier, staff and manatee watch volunteers have reported manatees using the spring heads at Three Sisters Springs with greater frequency on low tide events. On January 5, 2014, CRNWR staff implemented the first temporary cold weather closure of Three Sisters Springs. Nearly 300 manatees were observed using the warm water

springs at Three Sisters Springs during high tides, and over 100 manatees remained during low tides. During this event, air temperatures ranged from low 30s to low 50s for three days. The second closure of Three Sisters Springs warm water springs occurred from January 18 - 24, 2014, due to similar air temperatures and manatee numbers. A third closure occurred January 29 through February 1, 2014, with air temperatures ranging from the lower to upper 40s. Staff and volunteers observed hundreds of manatees seeking warm water in the interior of the warm water spring located at Three Sisters Springs during these cold weather temporary closure events.

3.1.3.2 Other Protected Species

There are no known listed plants on the site, or other threatened or endangered species.

Five sea turtle species are found in Florida's marine and estuarine waters: green, hawksbill, Kemp's Ridley, leatherback, and loggerhead. No sea turtles are known to use Three Sisters Springs. Eastern Indigo Snakes have not been reported on the Three Sisters Springs site. Gopher tortoises are not known to occur on terrestrial areas of the site.

Up to 23 wood storks use Parker Island each winter for roosting, especially on windy days, and they feed in and around CRNWR waters. These birds utilize land around the Three Sisters Springs, but not the warm water springs themselves. Florida sandhill cranes are usually seen flying over with an occasional pair landing at the property or next to the CRNWR Complex Headquarters. Six active bald eagle nests occur within 5 miles of the CRNWR headquarters and the Three Sisters Springs (Florida Fish and Wildlife Conservation Commission 2013c).

Gulf or Atlantic sturgeon has been reported as close as the Lower Suwannee River, but not in Three Sisters Springs warm water springs.

3.2 Human Environment

3.2.1 Wildlife-Dependent Recreation

The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd et seq.) provides authority for the Service to manage the CRNWR and its wildlife populations. In addition, it declares that compatible wildlife-dependent public uses are legitimate and appropriate uses of the National Wildlife Refuge System (NWRS) and are to receive priority consideration in planning and management. There are six wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. It directs managers to increase recreational opportunities on National Wildlife Refuges when compatible with the purposes for which the Refuge was established and the mission of the NWRS.

Manatee tourism to Kings Bay, recorded by CRNWR since 2009, has shown a significant and steady increase. Public visitation to Kings Bay occurs by boating, paddling, swimming, fishing, snorkeling, and other in-water activities throughout the year. Businesses catering to recreation have developed into thriving commercial operations that have increased considerably since the establishment of the Refuge in 1983. The Refuge only manages commercial use activities

associated with manatee guided tours and photography for Refuge lands and waters in Kings Bay. Currently, the Refuge administers 44 Commercial Special Use Permits; 34 are snorkeling/scuba operators and 10 are guided/rental non-motorized vessel outfitters. These businesses must report visitation numbers monthly (Appendix E). Permitted visitation to the Refuge has increased yearly from over 67,000 in 2010 to over 125,000 in 2013. During the most critical months for manatees, November through March, Commercial Special Use Permit holders reported an average visitation per day of 360 clients to the warm water springs located at Three Sisters Springs and Kings Spring. In March 2014, Commercial Special Use Permit holders reported the highest visitation recorded in one month with 17,046 visitors to the Refuge including Three Sisters Springs and Kings Spring. Over the last four years during the peak manatee season, guided visitation has increased from 275 visitors per day to 421 visitors per day to both Refuge springs.

This trend is expected to continue with visitation anticipated to exceed 140,000 visitors to Kings Bay during this 2014 -2015 manatee season. This includes the Three Sisters Springs, House Spring, Jurassic Spring, Kings Spring, and other areas of Kings Bay.

3.2.4 Socioeconomic Environment

The site is located within the city limits of Crystal River, Florida. Although with just over 3,000 residents, the City is 2.25 times more densely populated than the County, 1.5 times more than the State, and 6.2 times more than the U.S. While the median household income in the City is comparable to the County, it is lower than State and national income averages. Per capita income is higher for the City than the County, but is lower than State and national figures. The City is predominantly white and older, with the median age in the City (55.4) comparable to the County and older by nearly 15 years over the State median age and by 18 years over the national median age. The primary employers for Citrus County are: (1) Educational Services and Health Care and Social Assistance (23.9%); (2) Retail Trade (16.2%); and (3) Arts, Entertainment, and Recreation and Accommodation and Food Services (14.2%) followed by Professional, Scientific, and Management and Administrative and Waste Management (8%); Construction (7.2%); Transportation and Warehousing, and Utilities (7.1%); and Public Administration (6.9%). Unemployment rates are generally lower for the City (6.7%) and higher for the County (14.8%) than for the State (13.3%) and the U.S. (10.8%). A large part of Citrus County's economy is dependent upon its retired population. (U.S. Department of Commerce, U.S. Census Bureau 2012a, 2012b, 2012c, 2011a, and 2007).

Chapter 4 Environmental Consequences

This chapter describes the foreseeable environmental consequences of implementing the two management alternatives described in Chapter 2. When detailed information is available, a scientific and analytic comparison between alternatives and their anticipated consequences is presented, which is described as "impacts" or "effects". When detailed information is not available, those comparisons are based on the professional judgment and experience of CRNWR staff and Service biologists.

4.1 Summary of Effects

4.1.1 Alternative 1 (No Action Alternative)

4.1.1.1 Impacts to Biological Environment

The current condition of the biological environment attributes, including hydrology, and vegetative communities, would not experience any change under the no action alternative.

This alternative is likely to result in increased visitor/manatee interactions, which could lead to future take of manatees. Because other threatened, endangered, or protected species are not known to frequent the warm water springs located at Three Sisters Springs, the likelihood of disturbance of these species is low.

4.1.1.2 Impacts to Human Environment

This alternative would not change existing human environment conditions, including recreation and socioeconomics.

4.1.2 Alternative 2 (Proposed Action Alternative)

Within the authority of the National Wildlife Refuge Administration Act and the Agreement, the Service is directed to keep the warm water springs at Three Sisters Springs open to public recreation, maintaining and sustaining quality visitor experiences while at the same time providing adequate protected areas for manatees managed for the benefit of both manatees and visitors. The warm water springheads at Three Sisters Springs provide refugia to hundreds of manatees during cold-weather conditions and are considered among the highest priority thermal refuges for the species throughout its range (FCT 2010).

This alternative proposes to implement proactive management measures/strategies to address concerns related to increased crowding between manatees and the public inside the warm water springs at Three Sisters Springs for the 2014-2015 manatee season. These interim measures, described in Chapter 2, will be evaluated, monitored, and adapted to assist in developing final management actions to be implemented under the CCP. Collection of data on the following will occur (Appendix F):

- Number of visitors
- Average time visitors spend at Three Sisters Springs
- Manatee numbers
- Manatee reactions and/or interactions with visitors
- Weather conditions
- Tidal stage
- Gulf water temperatures
- Water Quality

4.1.2.1 Impacts to Biological Environment

The current condition of the biological environment attributes, including hydrology and vegetation, would not experience any change under the proposed action alternative.

Some manatees initiate encounters with visitors, but most manatees avoid or ignore encounters with people, preferring to frequent manatee sanctuaries where all human activities are prohibited. Research suggests that some manatees are harassed by visitors, despite the fact that all forms of harassment are prohibited by law. Scientists have conducted numerous studies on human – manatee interactions and expressed concerns over these interfaces. Hartman (1979) was the first to observe and describe how manatees respond to the presence of people in the water, observing that most manatees tended to avoid people, some ignored people, a few approached people and then left, and some approached and initiated interactions with people. These observations were made in Kings Bay's warm water springs and the author correlated a reduction in the number of manatees using the Main Spring with an increasing number of people (Hartman 1979). Concern has been expressed about manatees displaced from warm water springs for prolonged periods of time; prolonged exposure to cold can be fatal to manatees, especially for smaller animals (O'Shea 1995). Researchers have also observed and documented manatee responses to people and boats (Sorice *et al.* 2003, p. 324). Researchers noted increases in swimming, milling, and cavorting behaviors and decreases in resting, feeding, and nursing behaviors in the presence of increasing numbers of people and boats (Abernathy 1995, pp. 23–26; Wooding 1997, p. 1; King and Heinen 2004, pp. 230–231). They also observed that increases in numbers of boats and people prompted manatees to use other areas (Kochman *et al*. 1985, pp. 922–924; Buckingham *et al.* 1999, p. 514). However, none of these studies' observations of manatee responses to viewing participants and boats suggest that harm (killing or injuring of manatees) has occurred or is occurring (Sorice *et al.* 2003, p. 320). Nor have there been any significant increases in the number of cold-related injuries and mortalities in the northwestern Florida region, even in the recent extreme cold events, which killed large numbers of manatees in other portions of the winter range. For example, in the 2009–2010 winter cold event, only two deaths due to cold stress were recorded in Citrus County while to the south in Lee County, 24 manatee deaths were reported due to cold stress (FWC FWRI Manatee Mortality Database 2011 website). Manatee survival rates in the northwestern region are among the highest in Florida (Runge *et al.* 2007, p. 20).

Observations of manatee harassment in Kings Bay prompted the Service to promulgate a rule in 1979 that allowed the agency to designate manatee protection areas where certain waterborne activities, including boating and swimming, could be prohibited in order to "reduce the incidence of manatee injuries and deaths" and to "lessen the likelihood that manatees will encounter boats

and people" (44 FR 60964; October 22, 1979). Subsequently, three manatee sanctuaries were designated in Kings Bay in 1980 (45 FR 74880; November 12, 1980) and, in 1983 the Service purchased lands in and around Kings Bay and established the CRNWR for the purpose of protecting manatees and to educate the public about manatees.

In 1994, citing a doubling of the number of manatees in the area since 1980, a large increase in the number of visitors, the inability of the existing sanctuaries to provide sufficient shelter for manatees, and reports of increasing manatee harassment, the Service designated three additional sanctuaries in Kings Bay to prevent the take of manatees by harassment (59 FR 24654; May 12, 1994). This expansion was followed by the addition of another sanctuary in 1998, similarly justified by reports of increasing harassment and observations of increasing numbers of manatees, increasing numbers of recreational divers and snorkelers, and insufficient space for manatees to rest, free from harassment (63 FR 55553; October 16, 1998: See Table 1).

Table 1. Information justifying previous manatee sanctuary designations in Kings Bay, Florida.

Date of Kings Bay manatee sanctuary designations	**Approximate number of manatees using Kings Bay**	**Estimated number of people viewing manatees**	**Number of sanctuary designations NEW (TOTAL)**
November 12, 1980 (45 FR 74880)	100	30,000 to 40,000	3(3)
May 12, 1994 (59 FR 24654)	240	60,000 to 80,000	3(6)
October 16, 1998 (63 FR 55553)	250	100,000	1(7)

Over the last 30 years (1980–2010), the Service and the State of Florida have created a network of manatee protection areas within the Kings Bay area. This network was designed to prevent the take of manatees by waterborne activities, including but not limited to, boating and manatee viewing activities, and was established to allow manatees to continue to gain access to critical warm-water areas and important resting and foraging areas. During the manatee season (November 15 through March 31), the network includes seven Federal manatee sanctuaries (which are described in our regulations at 50 CFR 17.108(a)(1)–(a)(7)) and five State manatee protection zones (as described in Chapter 68C-22, "The Florida Manatee Sanctuary Act" (2010)).

The seven Federal sanctuaries are located at heavily–used winter, warm-water sites (springs) and foraging areas and preclude all waterborne activities within their boundaries, preventing take from both boating and manatee viewing within these areas. The State protection zones include year-round idle and slow–speed zones that prevent the take of manatees from high–speed watercraft collisions. Given the State's statutory responsibilities, the State designated a 35–mile per–hour (mph) (daytime) / 25 mph (nighttime) watersports area (watersports area) in Kings Bay between May 1 and August 31. This area encircles Buzzard Island in the center of the bay.

Refuge staff is concerned that the increased use of the warm water springs at Three Sisters Springs by the public could disrupt manatees from resting resulting in "take". Take, as defined

by section 3(19) of the Endangered Species Act, means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. ‘‘Harm’’ is further defined by regulation at 50 CFR 17.3 to mean an act which actually kills or injures wildlife. “Harass” is also defined by regulation to mean any intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). Take, as defined by section 3(13) of the Marine Mammal Protection Act (MMPA), means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. Under section 3(18) of the MMPA, harassment is defined to include any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. All take, including take by harassment, is prohibited.

During peak periods, especially weekends and holidays, increased public visitation to warm water springs at Three Sisters Springs has the potential to cause take of manatees. Because the confined springs at Three Sisters Springs are one of the few natural wintering manatee aggregation areas where human access is not controlled, inappropriate interactions between humans and manatees can occur from both swimmers and paddlers. Refuge staff currently educates visitors on passive observation procedures for interactions with manatees. However, swimmers can cause unintentional disturbance to manatees in a number of instances including: stumbling onto resting manatees due to lack of visibility during turbid conditions; touching resting surfacing manatees (breathing) due to misjudgment (sleeping vs. non-sleeping manatee); accidental kicking of resting manatees by swimmers; splashing and other swimming related noises; and free diving activity. Paddlers observing manatees from non-motorized vessels may unintentionally disturb manatees due to the reflection of glare on surface water restricting paddlers’ ability to see breathing or resting manatees on the surface. Paddlers accidentally paddle overtop of resting manatees causing unintentional disturbance while trying to avoid collision with surfacing manatees and/or swimmers. Manatee harassment, largely associated with wintertime manatee viewing activities, is known to occur, and the Service, State, and other law enforcement agencies actively enforce harassment laws in Citrus County and in Kings Bay. Cited acts of harassment include trespass by individuals viewing manatees in manatee sanctuaries where the Service has determined that any waterborne activity occurring within these areas will result in take of manatees, including but not limited to take by harassment. When observed, violators are warned or cited. During the winter of 2012/2013, refuge law enforcement officers issued 41 written warnings and/or citations within Kings Bay and Three Sisters Springs for violations of the Endangered Species Act or the Kings Bay Manatee Protection Area Rule. Manatees could be disturbed inside the warm water springs located at Three Sisters Springs from in-water wildlife viewing especially because no interaction-free refugia exist within the confined spring. Given past evidence of take (including harassment) of one or more manatees, and the establishment of manatee sanctuaries and refuges in Kings Bay, coupled with increased usage of the warm water springs at Three Sisters Springs and the increasing public demand to view manatees, the CRNWR deems it is necessary to implement these management actions to prevent take from occurring at Three Sisters Springs in the future.

The measures under this alternative will likely avoid take of manatees by providing two additional areas without public interactions due to two lobes of the warm water springs at Three Sisters Springs being closed to public access (Figure 3). The two new closed areas will preclude all waterborne activities within their boundaries, preventing take from both boating and manatee viewing within these areas. These lobe closures are provided for in the current Management Plan and are a measure that provides manatees space away from visitors in the Spring's interior. Since other threatened, endangered, or protected species are not known to frequent Three Sisters Springs the likelihood of disturbance to those species is low.

4.1.2.2 Impacts to Human Environment

This alternative would have negligible impacts to the human environment conditions, including recreation and socioeconomics. The Service acknowledges that this alternative may have some local economic effect but that would be negligible for the overall local economy. The public's support for manatees and their protection has been examined through contingent value studies (Solomon et al. 2004; Bendle and Bell 1995; Fishkind and Associates 1993). These economic studies characterized the value placed by the public on this resource and determined that the public's willingness to pay for manatee protection is significant and that public support for manatee protection regulations in general, such as that described in this alternative, exists. Additionally, this alternative guides public access to one side of the spring run and could limit the number of people within the warm water springs at Three Sisters Springs. While this alternative would reduce and/or restrict some users from within the interior of the warm water springs at Three Sisters Springs, the improved wildlife viewing opportunity could have a positive economic effect.

Table 2. Summary of Affected Environment.

Affected Environment	Alternative 1	Alternative 2
Biological		
Hydrology	No Change	No Change
Vegetation	No Change	No Change
Manatees	Potential Disturbance	Minimizing Likely Disturbance
Other Protected Species	No Change	No Change
Human		
Recreation	No Change	Potentially Improve Manatee In-Water Viewing
Socioeconomic	No Change	Potentially Increasing Cost per In-Water Visitor

4.2 Statement of Cumulative Effects

National Environmental Policy Act defines “cumulative impacts” as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. (40 CFR 1508.7).

Given the very limited physical scope of the proposed alternative (1.5 acres) and the temporary duration of the alternative (November 15 - March 31), no cumulative effects are likely. The information gathered from the temporary management actions may be used to guide future human/manatee actions at Three Sisters Springs, but any specific management actions will only apply to Three Sisters Springs. There will be no changes to the network of federal and state manatee protection areas in Kings Bay, to federal and state law enforcement efforts, or to the existing takings and harassment regulations currently in effect.

Literature Cited

Abernathy, J. 1995. Time–activity budgets and displacement rates in Florida manatees (Trichechus manatus) in the absence and presence of humans. Master's Thesis. Florida Atlantic University, Boca Raton, Florida. 27 pp.

Bendle, B.J. and F.W. Bell. 1995. An estimation of the total willingness to pay by Floridians to protect the endangered West Indian manatee through donations. Prepared for Save the Manatee Club and the Florida Department of Environmental Protection – Bureau of Protected Species Management. November. 61 pp. + appendices.

Buckingham, C.A., L.W. Lefebvre, J.M. Schaefer, and H.I. Kochman. 1999. Manatee response to boating activity in a thermal refuge. Wildlife Society Bulletin 27(2):514-522.

Fishkind & Associates. 1993. Economic impact of the Manatee Sanctuary Act. Technical Report. Prepared for the Volusia County Board of County Commissioners. February.

Florida Communities Trust [FCT]. 2010. Three Sisters Springs project management plan. Drafted by: The City of Crystal River, The U.S. Fish and Wildlife Service, and The Southwest Florida Water Management District. Florida Communities Trust (FCT) Project #08-088-FF8.

Florida Natural Areas Inventory (FNAI). 2010. Guide to the natural communities of Florida: 2010 edition. Florida Natural Areas Inventory, Tallahassee, FL, USA.

Florida Fish and Wildlife Conservation Commission. 2011a. Florida's Endangered and Threatened Species. Updated October 2011. Species Conservation Planning Section, Division of Habitat and Species Conservation, Florida Fish and Wildlife Conservation Commission. Tallahassee, FL. 10 pp. http://myfwc.com/media/1515251/Threatened_Endangered_Species.pdf

Florida Fish and Wildlife Conservation Commission – Fish and Wildlife Research Institute (FWC FWRI). 2010. Manatee Mortality Database. Website: http://research.myfwc.com/features/category_sub.asp?id=2241. Last accessed September 30, 2011.

Hartman, D.S. 1979. Ecology and behavior of the manatee (Trichechus manatus) in Florida. American Society of Mammalogists Special Publication No. 5. 153 pp.

King, J.M., and J.T. Heinen. 2004. An assessment of the behaviors of overwintering manatees as influenced by interactions with tourists at two sites in central Florida. Biological Conservation 117(3):227–234.

Kleen, J.M. and A.D. Breland. 2014. Increases in Seasonal manatee (Trichechus manatus latitostris) Abundance within Citrus County, Florida. Aquatic Mammals 40(1), 69-80, DOI 10.1578/AM.40.1.2014.69.

Kochman, H.E., G.B. Rathbun, and J.A. Powell. 1985. Temporal and spatial distribution of manatees in Kings Bay, Crystal River, Florida. Journal of Wildlife Management 49 (4):921-924.

O'Shea, T. 1995. Waterborne recreation and the Florida manatee. Pages 297–312 in R.L. Knight and K.J. Gutzwiller (eds.), Wildlife and recreationists: Coexistence through management and research. Island Press, Washington DC.

Runge M.C., Sanders-Reed C.A., and Fonnesbeck C.J. 2007. A core stochastic population projection model for Florida manatees (Trichechus manatus latirostris). U.S. Geological Survey Open-File Report 2007-1082. 41 pp.

Solomon, B.D, C.M. Corey-Luse, and K.E. Halvorsen. 2004. The Florida manatee and ecotourism: toward a safe minimum standard. Ecological Economics 50:101-115.

Sorice, M.G., Shafer, C.S., and Scott, D. 2003. Managing endangered species within the use/preservation paradox: Understanding and defining harassment of the West Indian manatee (Trichechus manatus). Coastal Management 31(4):319-338.

Southwest Florida Water Management District. 2012. Three Sisters Treatment Wetland Conceptual Design (W471). Prepared by Wetland Solutions, Inc.

U.S. Department of Agriculture Soil Conservation Service [USDA-SCS]. 1988. Soil survey of Citrus County, FL. U.S. Department of Agriculture, Soil Conservation Service (currently Natural Resource Conservation Service), Washington, DC, USA.

U.S. Fish and Wildlife Service. 2007b. West Indian Manatee (*Trichechus manatus*); 5-Year Review: Summary and Evaluation. Jacksonville Ecological Services Field Office and Caribbean Ecological Services Field Office, Southeast Region, U.S. Fish and Wildlife Service. Jacksonville, FL and Boqueron, Puerto Rico. 79 pp.

U.S. Department of Commerce, U.S. Census Bureau. 2012a. 2010 Demographic Profile. Washington, DC. http://www.census.gov/popfinder/ (Accessed 3/21/2012).

U.S. Department of Commerce, U.S. Census Bureau. 2012b. State and County Quick Facts. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report. Washington, DC. http://quickfacts.census.gov/qfd/states/00000.html (Accessed 3/21/2012).

U.S. Department of Commerce, U.S. Census Bureau. 2012c. USA Quick Facts. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics,

Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report. Washington, DC. http://quickfacts.census.gov/qfd/states/00000.html (Accessed 3/21/2012).

U.S. Department of Commerce, U.S. Census Bureau. 2011a. 2010 Census. Washington, DC. http://www.census.gov/ (Accessed 3/21/2012).

U.S. Department of Commerce, U.S. Census Bureau. 2007. American Communities Survey. Washington, DC.

Wooding, J. 1997. An assessment of manatee behavior relative to interactions with humans at Three Sisters Springs, Crystal River, Florida. A report submitted to the U.S. Fish and Wildlife Service. Florida Cooperative Fish and Wildlife Research Unit, University of Florida, Gainesville, Florida. 68 pp.

Appendix A

Three Sisters Spring

Management Agreement

And

Management Plan

Management Agreement for Certain Land Located Within the City of Crystal River, Citrus County, State of Florida

WHEREAS, the City of Crystal River , hereinafter referred to as the "CITY", and the Southwest Florida Water Management District, hereinafter referred to as the "DISTRICT", jointly own certain land, hereinafter referred to as the "PROPERTY", on an undivided interest basis, with the CITY holding 70% interest and the DISTRICT holding 30% interest, and;

WHEREAS, this PROPERTY consists of 57.1 acres and is generally known as the Three Sisters Springs property, with said PROPERTY located within the congressionally-approved boundary for management by the United States Fish & Wildlife Service, hereinafter referred to as the "SERVICE", as a part of the Crystal River National Wildlife Refuge, and;

WHEREAS, the PROPERTY was acquired through a multi-agency effort that included funding by the Florida Communities Trust, hereinafter referred to as "FCT", and is thus subject to certain limitations provided in the FCT Declaration of Restrictive Covenants (as recorded in OR Book 2368 Page 1378 in Citrus County)(the "DECLARATION,") and;

WHEREAS, as part and condition of the FCT funding, the CITY provided and FCT approved a Management Plan, hereinafter referred to as the PLAN, for the PROPERTY, and together with the DECLARATION, the terms of which are hereby incorporated herein by reference, and;

WHEREAS, CITY intends that the conservation and recreation values of the Property be preserved and enhanced in accordance with the PLAN, as it may be amended from time to time only after review and approval by FCT, and;

WHEREAS, All activities by the CITY, the DISTRICT, and SERVICE shall be consistent with the DECLARATION and PLAN, and;

WHEREAS, the CITY and the DISTRICT wish to enter into an agreement with the SERVICE wherein the PROPERTY will be managed by the SERVICE for the conservation, protection and enhancement of natural resources, and for outdoor recreation compatible with those goals, consistent with the Management Plan, hereinafter referred to as the PLAN, in place for the PROPERTY through the FCT grant process, and;

WHEREAS, the SERVICE is willing to manage the PROPERTY on the basis noted above inasmuch as the PROPERTY is of critical environmental importance as a habitat for the West Indian Manatee and thus complements and supports the mission of the Crystal River National Wildlife Refuge and the SERVICE.

NOW THEREFORE, the CITY, the DISTRICT, and the SERVICE hereby agree that the SERVICE will manage the PROPERTY for the public purpose of conserving, protecting, and enhancing the natural resources located within the PROPERTY, and in a manner which is consistent with the PLAN, which is attached hereto and made a part hereof, for an initial period of twenty-five (25) years from the effective date of this Agreement, on the following terms and conditions:

1. The SERVICE will manage the PROPERTY as provided for in the PLAN and in a manner which will not conflict with the conservation, protection, and enhancement of the natural resources located therein. However, nothing within this Agreement shall be construed to obligate the SERVICE to use appropriations to improve the PROPERTY.

2. The SERVICE will manage the PROPERTY as an extension of the Crystal River National Wildlife Refuge in accordance with: 1) the PLAN; 2) the National Wildlife Refuge System Administration Act of 1966, as amended, 16 U.S.C. ss 668dd; 3) other acts of general applicability to the National Wildlife Refuge System; 4) Title 50 of the Code of Federal Regulations, and 5) Florida law and regulations.

3. The PLAN will be reviewed jointly by the SERVICE, the DISTRICT, the FCT, and the CITY at no greater than 5-year intervals, and updated as necessary and as approved by the FCT. The SERVICE will not alter the PROPERTY or engage in any activity including restrictions on public access or commercial or recreational activities except as currently provided for in the PLAN, or as subsequently amended, without the prior written approval of the CITY and the DISTRICT.

4. Upon execution of this Agreement, the SERVICE will have the right to enter and occupy the PROPERTY for the purpose of managing the site in a manner consistent with the provisions of the PLAN.

5. The SERVICE will not conduct or authorize anyone else to conduct any activities that would interfere with the Wetland Area to be constructed by the DISTRICT within the PROPERTY. Upon completion of construction of the Wetland Area by the DISTRICT, the SERVICE will be responsible for the operation and maintenance of the Wetland Area and to conform to all the conditions specified in any permits issued for the construction of the Wetland Area for the duration of the Management Agreement.

6. Upon request by the CITY or the DISTRICT, the SERVICE will provide information regarding SERVICE operations within the PROPERTY that relates in any manner to this Agreement.

7. The SERVICE will immediately notify the CITY if evidence is found to suggest an archeological or historic resource on the PROPERTY, and shall also take appropriate measures to protect the resources. The collection of artifacts or the disturbance of archeological or historic sites that may be found or identified on the PROPERTY will be prohibited unless prior written authorization has been obtained from the Division of Historical Resources, Department of State. The management of archeological or historic resources found on the PROPERTY shall comply with the provisions of Chapter 267, Florida Statutes, specifically Sections 267.061 2(a) and 9b).

8. This Agreement does not and will not be construed to convey any title interest to the PROPERTY to the SERVICE from the CITY or the DISTRICT, but the SERVICE is hereby authorized to make such improvements as are required to comply with the provisions of the PLAN and to otherwise manage the site in a manner consistent with conserving, protecting and enhancing the natural resources found therein.

9. This Agreement may be terminated by the SERVICE without cause upon submission of written notice to both the CITY and the DISTRICT six (6) months in advance of the effective date of such termination. The Agreement may be terminated by the CITY and/or the DISTRICT only upon a

determination by one or both of those parties that the SERVICE has failed to manage the PROPERTY in accordance with the provisions of the PLAN or this Agreement, and then only after the SERVICE has been given a period of not less than three (3) months following written notice to correct documented performance shortfalls.

10. This Agreement will automatically be renewed for two (2) additional twenty-five (25) year terms upon expiration of the initial term, and may thereafter be renewed for additional terms upon mutual agreement of the SERVICE, the DISTRICT, the CITY, and FCT. Any option to renew this Agreement, if exercised, shall be affixed hereto, together will all additions, deletions and modifications to this Agreement.

11. This Agreement and any right and privileges relative to the PROPERTY contained herein are for the sole use of the SERVICE and shall not be assigned or transferred in whole or in part to any other party without the prior written consent of FCT, the CITY and the DISTRICT.

12. The SERVICE agrees to assist in the investigation of injury or damage claims either for or against the CITY or the DISTRICT pertaining to the SERVICE's responsibilities arising from management of the PROPERTY.

13. The liability of the SERVICE for the acts and omissions of its employees pursuant to this Agreement shall be governed by the Federal Tort Claims Act.

14. The SERVICE agrees that it will not discriminate against any individual based on race, color, religion, sex, national origin, age, handicap, or marital status with respect to any activity occurring within the PROPERTY that is the basis for this Agreement.

15. Unless specified herein to the contrary, this Agreement will be governed and interpreted by applicable Federal and State of Florida laws.

16. All notices given under this Agreement must be in writing and mailed to the address of the party or parties to whom notice is to be given, as designated by such party in writing. The SERVICE, the CITY, FCT, and the DISTRICT hereby designate their respective address for notification purposes to be as follows:

SERVICE	Refuge Manager Crystal River National Wildlife Refuge 1502 SE Kings Bay Drive Crystal River, FL 34429
CITY	City Manager City of Crystal River 123 N.W. Highway 19 Crystal River, FL 34428

DISTRICT	Land Resources Director Southwest Florida Water management District 2379 Broad Street Brooksville, FL 34604-6899
FCT	Community Program Manager Florida Communities Trust 2555 Shumard Oak Boulevard Tallahassee, FL 32399

IN TESTIMONY WHEREOF, witnesseth the signatures of the duly designated representatives of the SERVICE, the CITY, and the DISTRICT, this 28th day of July, 2010.

UNITED STATES FISH & WILDLIFE SERVICE

By: _____ Date: July 24, 2010
Cynthia Dohner, Regional Director

Witness: Merry B Bates

Print Name: Merry B Bates

CITY OF CRYSTAL RIVER

By: _____ Date: 7/27/2010
Andrew R. Houston, City Manager

Witness: Theresa Krim

Print Name: Theresa Krim

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

By: _____ Date: 7/16/10
Eric Sutton, Land Resources Director

Witness: _____
Print Name: Charles H. Lane Jr

Witness: _____
Print Name: Cheryl Hill

Reviewed and Approved by:

_____
Ken Reecy, Community Program Manager
Florida Community Trust

Reviewed and Approved by Legal
SWFWMD ATTORNEY

THREE SISTERS SPRINGS PROJECT MANAGEMENT PLAN

Florida Communities Trust (FCT) Project #08-088-FF8

A project of:
The City of Crystal River
The U.S. Fish and Wildlife Service, and
The Southwest Florida Water Management District

Revised July, 2012

Executive Summary

The effort to acquire the 57+/- acre Three Sisters Springs property for public ownership has been a multi-agency partnership focused on conserving three second-order magnitude springs and lands that surround them. The project is aimed at protecting these significant natural resource values from environmental degradation that would be caused by the development of proposed residential single-family and multi-family homes, as well as the potential for a bottled water facility. The Three Sisters Springs site is located within the acquisition boundary of the Crystal River National Wildlife Refuge (NWR) and represents what is arguably the most significant site for West Indian Manatee protection in all of Florida.

The Three Sisters Springs property is located immediately south of downtown Crystal River (FL), and originally was a part of a natural wetland ecosystem adjacent to Kings Bay. In the early 1970's the trees in the forested wetland were removed and an eight-acre lake was dredged in the center of the site. The dredged material was used to fill the immediate wetlands area with the intent of creating a site suitable for residential development.

In 2008, a 300+ unit residential development project was planned for the site. However, prior to completion of the site plan and permitting requirements, the property ownership group acknowledged the environmental importance of the site, and agreed to work with a coalition of conservation groups to see if a feasible plan could be developed to acquire the property for conservation purposes, while also continuing to move forward with development plans in the event the conservation acquisition effort failed.

As a cornerstone in this conservation endeavor, the City of Crystal River agreed to serve as the lead agency in what ultimately was a successful application for a Florida Communities Trust (FCT) grant. The acquisition effort was further bolstered by the Southwest Florida Water Management District (SWFWMD) stepping forward with Florida Forever funding to be used as the match for the FCT grant funding, which resulted in SWFWMD holding a 30% ownership interest in the site. SWFWMD further committed to creating a wetlands area on site to provide stormwater treatment for runoff from adjacent commercial and residential areas.

The Friends of the Crystal River National Wildlife Refuge Complex (Friends) and the National Wildlife Refuge Association took on the leading role in raising $2.7 million in private funding. The U.S. Congress appropriated $3.0 million to the US Fish and Wildlife Service (FWS) for land acquisition, with the City of Crystal River, Citrus County, the Citrus County Tourist Development Council also providing financial support. The $2.7 million in private financial support came from The Felburn Foundation and several other environmental groups, as well as a multitude of private citizens and various civic clubs. The FWS funding and the Felburn Foundation funding ultimately went to acquire the Consumptive Use Permit (CUP) and related water value from the site owners.

Since the inclusion of Crystal River/Kings Bay as a priority water body in its Surface Water Improvement and Management (SWIM) program in 1988, SWFWMD has pursued strategies and programs to improve water quality conditions in this unique tidally-influenced first-magnitude spring system. In keeping with those efforts, SWFWMD has committed to pursuing stormwater treatment via the construction of the previously-mentioned treatment wetlands on the Three Sisters Springs site. To further the environmental impact of this site, SWFWMD has also committed to including elements in the wetland design that will attract birds and other wildlife.

The FWS has committed to managing the overall site in cooperation with the City and SWFWMD. The FWS will manage the property as part of the Crystal River NWR under a management agreement with the City and SWFWMD. SWFWMD will be involved with the site through the completion of construction of the treatment wetland and will then turn the wetland over to FWS for management and maintenance.

Given the prime opportunities for land-based manatee observation that the Three Sisters Springs site offers, FWS has installed a boardwalk adjacent to the shoreline of the Springs. The environmental experience will be further enhanced through the development of an environmental center that will focus on manatees and the complex Kings Bay ecosystem. The site will also offer public amenities such as the creation of a nature trail, a nature discovery area, a picnic pavilion, a youth fishing pier on the lake, manatee viewing stations along the western edge of the site adjacent to Magnolia Springs (Gator Hole), and viewing opportunities related to the additional bird habitat that will be created as part of the wetland treatment area that will be constructed on the site.

The conservation of the Three Sisters Springs property fulfills the City's long-term goal of creating a waterfront open space with trails and connection to Kings Bay. Additionally, the City is working to further bolster the City's eco-tourism trade and the City will be providing safe pedestrian/biking access from its downtown area to the Three Sisters Springs site. That access will connect the Three Sisters Springs site to the City's other waterfront parks and the various water-based activities that define the City of Crystal River.

With time, the Three Sisters Springs site is expected to become a critical resource for the observation and protection of the manatee, while also playing a key role in the restoration and maintenance of water quality within the Kings Bay/Crystal River springs system. The environmental education center, manatee viewing opportunities, nature trails, and restored wildlife habitat will further enhance an environmental experience that will be in total keeping with the area's reputation as "Florida's Nature Coast".

Table of Contents

Introduction

The Three Sisters Springs project involves the public acquisition of a 57-acre site that contains three second-order springs that play a critical role in both manatee protection and efforts to restore water quality in the Kings Bay/Crystal River spring system. The site is located in the City of Crystal River, on the west coast of Florida.

The site was originally a part of wetlands ecosystem located adjacent to Kings Bay. In the 1970s, the property was cleared and filled with the intent of creating a building site suitable for residential development. A development plan involving the construction of more than 300 residential units had been approved at the time a multi-agency cooperative effort was initiated to bring the site under public ownership.

In addition to the three second-order springs found on the site itself, there is a second order spring (Magnolia Springs) located along the western perimeter of the property and another second-order spring (Idiot's Delight) located along the southeast portion of the property. The man-made waterway fed by Magnolia Springs is a seasonal sanctuary for manatees, with a second sanctuary located where the run from the Three Sisters Springs feeds into a waterway that flows into Kings Bay. During cold weather, manatees heavily utilize the two warm-water sanctuaries and the Three Sisters Springs themselves.

The successful effort to acquire the site resulted in the property being owned by both the City and the SWFWMD, with FWS acquiring the Consumptive Use Permit and managing the property through an agreement. If the FWS is unable to provide management of the site at any point in the future, the City will either seek another governmental entity to manage the site, manage the site itself, or allow ownership of the site to revert back to FCT. The FCT grant funding for land acquisition was supplemented by funding that came from the City of Crystal River, Citrus County, the Citrus County Tourist Development Council, a number of other conservation non-profits, and a multitude of private citizens and local civic clubs. In addition, FWS and the Felburn Foundation provided funding that went to acquire the Consumptive Use Permit (CUP) and related water business from the owners of the site.

In accordance with the terms of the FCT grant, the City of Crystal River has, in conjunction with FWS and SWFWMD, developed this Management Plan to ensure that the project site will be developed in accordance with the Grant Award Agreement and in a manner consistent with the grant application. As explained further herein, this Management Plan describes the ultimate development of a nature discovery area , a nature trail, at least one picnic pavilion, a fishing dock, and aboardwalk adjacent to Three Sisters Springs and two (2) manatee viewing stations adjacent to Magnolia Springs that will allow the public to observe manatees in their natural setting; construction of an environmental education center that will focus on manatee protection

and watershed restoration; and the creation of a treatment wetland on the site that will treat storm-water from adjacent commercial and residential areas prior to such runoff being released into the Kings Bay/Crystal River springs system, thus improving the health of Kings Bay. The project site will be managed for the conservation, protection and enhancement of natural resources, and for outdoor recreation compatible with those goals.

Purpose

The Three Sisters Springs project was pursued by a broad array of public and private partners for the purposes of:

- Creating superb outdoor-oriented recreational and educational opportunities such as wildlife viewing, wildlife photography, and environmental education, for both the citizens and visitors to Crystal River, compatible with the all purposes of the project;
- Conserving, protecting and enhancing natural resources;
- Protecting and recovering endangered West Indian Manatees and other fish and wildlife;
- Restoring native habitat and biodiversity;
- Protecting water quality and quantity in Kings Bay, Florida; and
- Protecting the scenic and open space qualities of the Three Sisters Springs property.

Project Consistency with City's Comprehensive Plan

The Three Sisters Springs project supports the City's Comprehensive Plan in a number of ways, as indicated below:

Conservation Element

The Conservation Element states that "the City shall protect and conserve the natural functions of rivers, bays, wetlands, estuarine, and marine habitats, in order to assure the protection of fisheries, native flora and fauna and associated habitat, and especially species designated as endangered, threatened or species of special concern under the Endangered Species Act." [Objective 1.3] There is also language that states that "No net loss of essential upland habitat for endangered or threatened species or species of special concern will be permitted." [Objective 1.6] In addition, there is language that states that "the present quality of surface and groundwater entering Kings Bay and Crystal River will be maintained." [Objective 1.11] The Three Sisters Springs project clearly supports these objectives by protecting manatee habitat and the present quality of water entering Kings Bay, both through protection of the springs themselves and by providing for wetlands treatment of stormwater runoff from adjacent commercial and residential areas.

Recreation Element

The Recreation Element states that "public access to natural resource-based parks will be provided to assist in meeting Crystal River's recreation demands without diminishing the overall quality of those resources." [Goal #1] Specific objectives that will be supported by the Three Sisters Springs project include increasing the amount of public fishing pier access [Objective 1.1]; establishing one mile of nature trails within Crystal River [Objective 1.3]; establishing a program for the identification, designation, management and protection of environmentally sensitive lands [Objective 1.4]; and providing for a sufficient quantity and distribution of open space to meet the City's needs [Objective 3.1]. By providing open space, protection of the natural resources, and a nature trail, the Three Sisters Springs project is both consistent with and strongly supportive of the goals set forth in the Recreation Element of the City's Comprehensive Plan.

Coastal Management Element

The Coastal Management Element establishes that the City shall "ensure the protection and enhancement of significant vegetative communities which support wildlife through preserving the diversity and viability of Coastal habitat areas." [Objective 1.1] it further establishes that the City will "increase public access to the Coastal Area's natural resources through acquisition of new property, which will be consistent with the public's needs and the natural resource capacity of the selected area." [Objective 5.1] The Three Sisters Springs project will preserve the viability of the on-site habitat areas and increase public access to a natural coastal setting, with appropriate management oversight.

The City of Crystal River has amended the land use of the property to open space to protect the property in perpetuity and allow for compatible recreation and conserve the property's unique natural resource features. The zoning will be changed in 2012 in conjunction with a city-wide update of zoning changes.

The project area is surrounded by intensive housing developments on three sides and commercial development on the fourth. Residents in the immediate area have voiced concerns over privacy and disturbance from the expected large number of visitors to the project area. To address that concern, the project development will minimize conflicts with the neighborhood by orienting manatee viewing statonsaway from houses to the extent reasonably possible and promoting native vegetation along the property boundaries to screen the public from neighbors and protect watercourses.

Natural and Cultural Resources

Natural Communities

The Three Sisters Springs property is approximately 57 acres of filled in forested wetlands with a man-made lake in the center of the property. Grasses and recently-

planted pine trees currently dominate the site, with beautiful natural springs (i.e.Three Sisters Springs) located in the southern center of the property. The Three Sisters Springs are surrounded by an edge of cypress and red maple with a variety of shrubs. The fields are made up of non-native cool season grasses, native herbaceous plants and recently-planted pine trees. The elevation and vegetation of the site have been altered considerably since the 1940s. Based on an examination of historical aerial photos as well as remnant vegetation along the perimeter of the site, it is likely that the majority of the property was originally either mesic or hydric hammock. These forests were removed over time and the elevation of most of the site was increased via fill material generated during the excavation of the existing lake. The man-made lake is approximately 8 acres in size and 40-feet deep; sides of the pit are steep and there is virtually no littoral zone.

A Biological Survey and Wetland Assessment Report was conducted for the Three Sisters Springs Site at the request of Three Sisters Springs Holding, LLC. A copy of their report dated December 14, 2007 can be found in Appendix III. Additional species observed that were not found during this survey include Florida sandhill cranes (*Grus canadensis pratensis*) and Southeastern American kestrels (*Falco sparverius paulus*), two state threatened species. A gray fox and raccoons have been observed on site and the likelihood of armadillos and otters using the area is high.

Lake Lynda is an artificial lake created by the filling of the property in the 1970s. Currently, Lake Lynda provides little habitat for fish, birds, and amphibians and poses a hazard to the public because it is deep and has sharp and steep sides with no littoral zone. To the extent that funding is available and sufficient fill is available from the creation of the wetland treatment area, the City will work with SWFWMD to create shallow, littoral habitat along the shoreline of the Lake Lynda borrow pit to enhance the aquatic habitat.

Manatee Management

The project area is one of the most important properties in Florida for West Indian Manatees. To illustrate, more than 250 manatees, representing approximately 5% of the entire Florida manatee population, were observed using this site during the abnormally cold winter of 2009/2010. The manatees use the three springs on the property, which deliver millions of gallons of 72-degree water each day. As previously mentioned, the protection of manatees was one of the driving goals of the project. Three Sisters Springs
I is particularly important to mothers with newborn calves.

The Three Sisters Springs will remain open to the public to be used for kayaking/canoeing, swimming, snorkeling and diving, subject to any restrictions that may be implemented through the provisions of the Management Agreement in place for the Three Sisters Springs site. In keeping with the intent of maintaining and sustaining

quality visitor experiences while at the same time providing adequate protected areas for manatees, FWS will consider using existing federal rule making/processes to manage the balance of visitors and manatee use. For instance, consideration will be given to temporarily close portions of the springs during the coldest winter months to give mothers with calfs opportunity to rest without disturbance. This will also give the general public opportunities to view manatees without swimmers. These partial and temporary closures would allow for a portion of the springs to remain open for traditional water use. Another consideration would be closing the entire springs on the very coldest days of the year to prevent overcrowding by manatees in the existing manatee sanctuaries. These full closures will only happen rarely and last for short periods of time. Several large boulders that had previously been placed in the Three Sisters outflow to prevent boats from accessing the Three Sisters Springs have been removed. These boulders impeded the movement of manatees in and out of Three Sisters during low tide thus making the springs unavailable to manatees for 20% to 30% of the time. The removal of these boulders make the Three Sisters available to manatees throughout the whole day and other means will be used to keep boats from entering the springs.

Magnolia Springs will be closed for public use during the winter months as a manatee sanctuary, as it has been. The project acquisition will not change management of Magnolia Springs, but will provide improved wildlife viewing opportunities.

The shallow water basking area across from Idiot's Delight Spring and at the mouth of the Three Sisters outflow will remain a manatee sanctuary.

The manatees in all the springs of the project area will be regularly monitored by the FWS. This monitoring includes periodic surveys and daily checks for injured animals. The management will also include refuge environmental interpretation and law enforcement. The Refuge has two refuge officers that will regularly patrol the site for human/manatee conflicts to help ensure the recovery of this endangered species.

Restoration

The 50-acre upland area will be restored by planting upland forests with live oaks, red cedar, cabbage palms, wax myrtle, and other species native to the area. The slash pine trees planted by the previous owner will be removed since they are not representative of the historic native plant community on the site. Some areas will remain open to attract a variety of wildlife species. Nest boxes may be provided for bluebirds and bats. As resources are available, a garden with native species may be planted to attract butterflies. Restoration of mesic and/or hydric hammock on the site may require removal of some fill material. Replanting of mesic hammock with native species will be limited primarily to areas surrounding the springs and along the canal that flanks the southern

and western borders of the property. A wetland area will be created by SWFWMD south of the lake, which will be planted with native emergents to make it attractive to wading birds.

In addition to the work already performed to remove or re-position boulders at the mouth of the spring run to allow manatees to access the springs on low winter tides, FWS will work with spring restoration experts to contain erosion around the spring edges and remove organic material from the spring vents as necessary to maintain sufficient flow. FWS will coordinate the development of a shoreline stabilization plan with FCT and obtain FCT's approval of the plan prior to the implementation of the stabilization plan.

To minimize disturbance to manatees, an observation boardwalk has been installed to restrict foot access to the actual shoreline while still affording viewing opportunities.

Water Treatment Wetlands

A portion of the property will be devoted to stormwater treatment wetlands to be created on the east side of the property. The runoff from the commercial and residential areas east of the property will flow through the treatment wetland before being discharged into the channel towards Kings Bay. The treatment wetland will improve the quality of stormwater entering Kings Bay. The wetlands will be created, designed and constructed by the SWFWMD, with design input from the FWS to also allow the wetlands to provide wildlife habitat. The wetlands will be designed in such a way as to maximize benefits to wetland wildlife while meeting treatment goals. The wetland treatment area will be integrated into the natural landscape to facilitate use of the site for education and recreation purposes, with shallow slopes. The wetland treatment facilities will be designed in such a manner that the wetland treatment areas will not need to be fenced. Previously, stormwater from these areas was discharged directly into a canal that forms the eastern border of the site.

Exotic Plant Program

The uplands contain some exotic plants including Brazilian pepper (*Schinus terebinthifolius*), cogon grass (*Imperata cylindrical*), and air-potato (*Dioscorea bulbifera*) which are all listed as Category I species on the Florida Exotic Pest Plant Council list. All exotics will be removed from the property. The property will be monitored annually and is any invasive exotic plants are identified actions will be taken to have them removed. The "Exotic Pest Plant Council's List of Florida's Most Invasive Species" will be used to identify invasive exotic plant species; a copy of that list is provided within the appendix.

Feral Animal Program

The property will be monitored for exotic and feral animals. Any exotic or feral animals found on the site will be removed by qualified personnel.

Listed Plant Species

Currently, there are no known listed plant species found on the site.

Listed Animal Species

The West Indian manatee, Florida sandhill crane and wood stork have been identified using the site. The development of the site will be done in such a manner to enhance the habitat used by listed species, with a strong emphasis on protecting the manatee habitat.

Flora/Fauna

A flora/fauna list is provided as a biota summary within the Exhibits portion of this plan.

Archaeological, Cultural, and Historical Resources Protection

There are no known archaeological, cultural, and historical resources on the site. The City will notify the Division of Historical Resources immediately if evidence is found that indicates an archeological or historic resource at the project site, and will also take appropriate measures to protect such resources. The collection of artifacts or the disturbance of archeological or historic sites that may be found or identified on the project site will be prohibited unless prior authorization has been obtained from the Division of Historical Resources within the Department of State. The management of the archeological and historic resources will comply with the provisions of Chapter 267, Florida Statutes specifically Sections 267.061 2(a) and (b).

Structure and Improvements

Acknowledgement and Boundary Signs

There will be a sign at the entrance of the property (not less than 3' X 4' in size). The sign will acknowledge that the property was acquired using funds from the Florida Communities Trust and the SWFWMD. The sign will also acknowledge the managers of the property (FWS) and major financial contributors (the Felburn Foundation, SWFWMD, Jane's Trust, Citrus County, Citrus County Tourist Development Council, the City of Crystal River, and FWS). In addition, the boundary will be posted with approved federal signs designating the property as a National Wildlife Refuge and regulatory signs as needed.

Existing Physical Improvements at the Time of the Acquisition

A small dock on the Three Sisters Springs, two picnic tables with shades, barbeque pit, storage shed, barbed wire fence and an entrance gate all these structures have been removed.

Proposed Physical Improvements

Observation Platform:

An observation boardwalk has been constructed along the perimeter of the Three Sisters Springs that incorporates numerous observation stations and allows numerous open views of the Springs and the Idiot's Delight sanctuary area. In addition, two manatee viewing stations will be installed on the western edge of the property adjacent to Magnolia Springs. These viewing stations will be designed and installed in such a manner as to allow public observation of the manatee seasonal sanctuary area while taking into account the privacy concerns of the adjacent residences.

Nature Trail:

The project will include a land-based nature and hiking trail with minimal disturbance of natural resources. The trail will provide visitors with a view of the treatment wetland and connect the education center, the fishing pier, the nature discovery area, and the picnic pavilion(s).

Bicycle Trail:

The City is designing an extension of its current Crosstown Trail to connect to the property to allow people to visit the property in a carbon-friendly manner. Refuge visitors will not be able to ride their bicycles through the property, but will be able to access the property via bicycle.

Picnic Pavilions

At least one picnic pavilion will be provided within the project site. As resources become available, additional picnic pavilions will be considered.

Fishing Pier

A handicapped-accessible fishing dock will be developed on the man-made lake to provide recreational fishing to the general public. The dock will be placed on the west side of the lake. There will be interpretive panels explaining the species of fish in the lake, and catch-and-release practices will be encouraged. Due to the limited size of the lake and the potential for over-fishing to deplete the fish population, FWS may implement restrictions on fishing upon a finding that the fish population is being reduced to an unacceptable level.

Education Center

The project will include an education center that may be located on property located immediately to the east of the project site or on the project site itself, depending on the availability of future resources. The center will be located away from critical wildlife habitat, wetlands, and water bodies. The center will provide information on the springs and their function as a manatee sanctuary, as well as the role the property plays in protecting the manatees and water quality.

At least 12 environmental or historical educations classes or programs will be provided on site per year. The classes/programs will educate visitors about the springs and their function as a manatee refuge, as well as the role of the springs in protecting water quality in the Crystal River Outstanding Florida Waterway.

Final design of the education center will require review and approval from FCT.

Nature Discovery Center

The project site will be enhanced by a nature discovery area that will be oriented to young children. Activities at the discovery center area may include activities such as climbing and crawling area, interactive music activities, interactive water activities, and interactive natural art areas.

Parking Facilities

Size: A parking lot of not less than 40 spaces will be constructed adjacent to the environmental education center if the education center is ultimately located on the site, and an adjacent overflow lot and grass area will be designated for overflow during major events. If the education center is ultimately located off-site and adequate parking is located at that location, on-site parking will be minimized.

Visitor Carrying Capacity: The calculated number of parking spaces is also tied to the maximum number of visitors that the observation boardwalk can accommodate during the highest visitation period (December – March). The boardwalk provides more than two manatee viewing areas.

Turnaround Lapse: Vehicle turnaround times (the amount of time spent by a vehicle occupying a parking space) were also considered in the process of calculating the number of parking spaces. Based on observations from other manatee viewing sites, it's apparent that visitors who view manatees tend to spend prolonged periods (15 minutes average) of time watching manatees.

Parking/Entrance Location: The parking lot entrance will most likely come from the northeast corner of the property and parking will most likely be in the northern portion of the property. The site will be easily accessible from U.S. Highway 19.

Materials: The parking lot and access road will be created using permeable materials that will accommodate drainage requirements. To the degree possible, natural materials will be used to enhance the appearance of the site.

Landscaping

Minor landscaping will be placed around the entrance way and the visitor center. All plants will be native to Central Florida. Landscaping around the education center could include the planting of a pollinator garden. These plants will be drought tolerant and require no watering or pesticides or herbicides. The plants will include berry producing shrubs and native herbaceous plants that are attractive to pollinators. Landscaping may include butterfly gardens and areas to demonstrate natural succession of native plants.

Wetland Buffer

Native forested buffers will be restored along the properties wetlands and water-bodies to protect water quality. The exceptions will be around the observation boardwalk and the treatment wetlands that will be created for improving King's Bay water quality and provide habitat for cranes, wading birds, waterfowl, water birds, and shorebirds. The impoundments will be surrounded by dikes seeded into cool-season grasses.

Stormwater Facilities

A treatment wetland, as previously described, will be created on the property to treat water running off of neighboring commercial and residential properties. The wetland will improve King's Bay water quality, and can also be used to treat run-off from the property's parking site. The wetlands will be designed to look as natural as possible, with shallow slopes. The treatment wetlands will be designed to attract birds and other wildlife and will be used to provide additional wildlife viewing opportunities in the project area.

Hazard Mitigation

Appropriate hazard mitigation will be in place around the parking site and fuel storage locations (if any). All structures and facilities will be designed to mitigate impacts by 100-year floods, hurricanes, and other severe natural events.

Interpretive Signs

Several interpretive signs will be installed to educate visitors about the springs and their role as a manatee refuge, water quality issues of the Crystal River Outstanding Florida Waterway, and the native upland and wetland plantings.

Permits

Development work will likely include the construction of structures such as an education center, observation platform(s), fishing pier, trail(s), parking lot and signage. Restoration activities will include storm-water facilities and exotic plant removal.

A number of potential permits and/or orders and authorizations for development and restoration activities have been identified. These can include:

- A State Programmatic General Permit (SPGP) for minor work located in waters of the United States (including navigable waters)
- A Noticed General Environmental Resources Permit issued by the Southwest Florida Water Management District in conjunction with the Florida Department of Environmental Protection
- A Nationwide Permit 27 for stream and wetland restoration activities issued by the U.S Army Corps of Engineers.
- An authorization to use Sovereign Submerged Lands
- Section 7 from USFWS

Although FWS will not be required to obtain any city permits, they will notify the City whenever they are planning the construction of any building or other improvement that would normally require such a permit.

As part of the FCT grant conditions, and to ensure that other permitting requirements are not missed, the following agencies will be contacted prior to initiating any site development activities:

- Florida Fish and Wildlife Conservation Commission
- Florida Department of Environmental Protection
- Florida Department of Agriculture and Consumer Services, Division of Forestry
- Florida Department of State, Division of Historic Resources
- Southwest Florida Water Management District
- U.S. Army Corps of Engineers

Estimated Cost of On-Site Physical Improvements

Creation of Wetland Treatment Area	$500,000
Installation of Viewing Station(s)	$ 30,000
Observation Boardwalk	$160,000
Creation of Nature Trail	$ 50,000
Nature Discovery Area	$ 40,000
Picnic Pavilion	$ 25,000
Fishing Pier	$150,000
Education Center	$350,000
Parking Facilities	$ 75,000
Restoration of Wetland Buffer	TBD
Interpretive Signs	$ 10,000

Acquisition of land for Off-Site Visitors Center (conceptual)		$1,000,000
Construction of off-site Visitors Center (conceptual)		$2,000,000

Projected Timeline

Creation of Wetland Treatment Area	Design	2011
	Construction	2012
Installation of Observation Boardwalk		2011
Installation of Wildlife Observation Platforms		2013
Creation of Nature Trail		2013
Installation of Viewing Station(s)		2014
Picnic Pavilion		2014
Fishing Pier		2015
Education Center		2015
Discovery Center		2015
Parking Facilities		2012
Restoration Wetland Buffer		2013
Interpretive Signs		2014
Entrance sign with FCT recognition		2012
Exotic plant removal		2012 then annually
Landscaping		2012-2016
Upland restoration		2012-2016
Bike rack		2015
Bike trail access from Crosstown Trail		2015
Amend Future Land Use Designation		2011
Amend Zoning Designation		2012
Plant survey/monitoring		2012 then annually
Wildlife survey/monitoring		2012 then annually
Photo monitoring		2012 then annually
Feral animal removal program		2012 then annually
Educational programs		2012 then annuallu
Annual Stewardship Report		**2010 then annually**

Public Uses:

Water Access to the Three Sisters Springs

The public currently accesses the Three Sisters Springs by water, entering the springs while in the water or by kayak/canoe, primarily to view manatees, no motorized crafts, such as motorboats, jet skies, etc., will be allowed the springs or the spring run. Management activities will include providing compatible, wildlife-oriented recreational opportunities for visitors while optimizing use of the springs for manatees. Compatible uses of the site will likely include existing in-water uses, managed to enhance visitor

experiences and minimize manatee disturbance. FWS may enact partial closure of Three Sisters Springs during the coldest winter months and would consider full closure only for extreme cold winter events.

Management actions concerning the protection of manatees in the springs and adjacent areas will be addressed independent of the acquisition and will be made with input from the public as provided for by federal law.

Land Access to the Springs

At present, the public is prohibited from accessing the springs from land and are prohibited from accessing the shoreline and property from the water. Inasmuch as the water bottoms are included in the acquisition, access to the water bottoms from land and water will be managed. Management actions will include preserving shoreline vegetation, controlling erosion, and maintaining water clarity. Consistent with these actions, access to the water from land and vice versa will continue to be restricted. Manatee rescues and regular maintenance activities will be the only exceptions to these restrictions. Land-based uses will include the use of an observation boardwalk to provide visitors with an opportunity to view manatees from shore; gates in the boardwalk will be provided to allow access to the shoreline by law enforcement and USFWS personnel, but will be locked to prevent public access.

Fishing

Fishing in the springs is not compatible with currently planned visitor activities or with manatee protection, and therefore will not be allowed in the springs. However, there are opportunities for limited fishing in the man-made lake and a fishing dock is planned. In order to minimize disturbance from angling activity and fishing gear litter, these uses will be controlled and monitored. All fishing activities will be restricted to a designated fishing pier and fishing will not be permitted on any other area of the property in order to minimize wildlife disturbance. The fishing pier will be ADA-compliant and would be of sufficient size to accommodate several individuals at one time. The springs and the shoreline of the Refuge will be closed to fishing year-round.

Festivals & Special Events

The project site may be used for festivals and special events that are oriented toward conservation/appreciation of natural resources, wildlife protection, and other environmental themes.

Management Issues

Coordinated Management

The Three Sisters Springs property will be managed by (FWS) and the Southwest Florida Water Management District, with the District's involvement limited to creation of the

wetlands treatment area and related replanting efforts. FWS has broad experience in co-managing property with municipal and state governments. The property will be managed as part of the Crystal River National Wildlife Refuge. The governance of refuges follows the National Wildlife Refuge Administration Act, as amended, the Refuge Recreation Act, and other regulatory statutes.

All parties to this Plan agree that no activity will be conducted or permitted on the property that adversely impacts the volume of flow from the Three Sisters Springs or the quality of the water being discharged therein. It is expressly agreed by all parties that public access to the spring for kayaking/canoeing, swimming, snorkeling, diving and wildlife observation does not adversely impact the integrity of the springs, as long as they are properly managed.

Bicycle/Walking Access

An extension of the City's Crosstown Trail is under design to provide for access to the Three Sisters Springs property. Entry into the property may require payment of an entrance fee. Vehicle and pedestrian entrance fees will be used by the U.S. Fish and Wildlife Service to maintain property facilities, including the land-based nature and hiking trail to be provided within the property.

Maintenance

The U.S. Fish and Wildlife Service will be responsible for the long-term maintenance of all the facilities on the Three Sisters Springs property. The Fish and Wildlife Service will use revenues from entrance fees and Refuge operations budgets to fund the needed maintenance, and will build a maintenance area on the site.

Security

The National Wildlife Refuge Complex staff that manages Crystal River National Wildlife Refuge has two full-time Refuge Officers. These Officers will provide law enforcement and security for the property. Additional Officers can be provided by the Service at special events or particularly busy times.

Entry Fees, Concessions, and Leases

Entry Fees: The Service anticipates establishing a user fee. The fee amount may vary by season (summer vs. winter). Seasonal passes are being considered. The Service will compare other similar sites and their respective entrance fees to determine consistent user fee amounts. A report on the revenues and expenditures associated with the collection of entry fees will be incorporated within the annual report submitted by FWS to the City.

Management Agreement: The FWS will hold a management agreement over the entire property to manage the property. The management agreement will be multi-year in

length and will obligate the FWS to manage the project in such a way as to allow the City to comply with the terms of the FCT grant and allow SWFWMD to manage their lands in accordance with that agency's policies. If the FWS gives up their management agreement for any reason, or fails to adequately perform, the City would be responsible for finding another agency to manage the property, managing the property itself, or being required to allow the ownership of the property to revert back to FCT.

Concessions: The Friends of the Crystal River National Wildlife Refuge may operate a concession in the education center. FWS will manage all concessionaire activities in accordance with Federal regulations.

It is acknowledged that the City must provide 60 days written notice to FTC on the lease of any interest, the operation of any concession, or other contracts of a similar nature, and that execution of any such document requires review and approval by FTC.

Staffing Requirements

There are 10 existing full-time employees available to staff the project from the Crystal River National Wildlife Refuge. These staff members include Refuge Managers, Recreational Specialists, Law Enforcement Officers, Biologists, and Maintenance Workers. Cost estimates for initial management of the site are shown in the table below. These costs will be covered under the existing refuge budget, as funding is available. All staffing and management actions for the project are contingent upon availability of funding through the Federal government budget process.

Cost Estimates for Initial Management

Refuge Manager – 10% FTE	$ 15,000
Asst. Manager – 10% FTE	$ 10,000
Wildlife Biologist – 10% FTE	$ 10,000
2 Law Enforcement Officers – 25% FTE each	$ 57,000
Recreational Specialist – 20% FTE	$ 15,000
2 Maintenance workers – 20% FTE	$ 34,000
Maintenance Fund -	$ 25,000
TOTAL	$116,000

As funding becomes available, the refuge will seek to add positions to increase management and education at the site, including two entrance gate workers, a Law Enforcement Officer, a Maintenance Worker, a Supervisory Recreational Specialist and two Interpretive Park Rangers. These additional positions and maintenance cost

estimates are shown in the table below, but are once again dependent on the availability of funding. Once the property has been developed and is open fully to the public, anticipated user fee collections may reach approximately $375,000 annually. These fees will be placed in a separate account and will be used for the upkeep and maintenance of the project site.

Cost Estimates for Increased Management with Property Development

2 Fee Booth Collectors – 100% FTE each	$ 90,000
Law Enforcement Officer – 100% FTE	$100,000
2 Interpretive Park Rangers - 100% FTE	$170,000
Supervisory Recreational Specialist – 100% FTE	$100,000
Maintenance Worker – 100% FTE	$ 85,000
Maintenance Fund	$200,000
TOTAL:	$745,000

Once the property has been developed and is open fully to the public, anticipated user fee collections may reach $375,000 annually. These fees will be placed in a separate account and will be used for the upkeep and maintenance of the project site. Additional funding necessary for the development and management of the property will be provided through the normal Department of Interior funding cycle as additional funds become available.

Monitoring and Reporting

FWS will be responsible for monitoring the project area. The FWS will monitor the following:

- Number of visitors
- Number of cars, kayaks, and bicycles used to access the project area
- Number of manatee/ human disturbance issues
- Weather and need for temporary manatee closures
- Manatee use of the project area
- Wading bird use of the project
- Removal of exotic plants
- Removal of exotic and feral animals
- Infrastructure needs

These findings will be compiled in a report and given to the City of Crystal River and FCT on an annual basis, with such report to be filed by no later than January 30th of each year. The City, SWFWMD, and FWS will meet each quarter to discuss issues relating to the management of the project area.

Management Plan Revisions

It is acknowledged that written approval must be requested from FCT before undertaking any site alterations or physical improvements that are not addressed in the approved management plan.

Exhibits

A. Location Map
B. Master Site Plan
C. Public Lands Map
D. Natural Communities Map
E. Biota Known or Likely to Occur at Three Sisters Springs (Crystal River, Florida)
F. Copy of the Exotic Pest Council of Florida's Most Invasive Species List
G. City Bike Tail Network Map
H. Copy of Grant Award Agreement or Grant Contract
I. Interagency Agreement

Appendices

I. Executive Summary Site Suitability Study Three Sisters Springs Property, Crystal River, FL. 2004. HSA Engineers and Scientists.

II. Biological Survey and Wetland Assessment Report for the Three Sisters Springs Site, Citrus County, FL 2007. Biological Research Associates.

Appendix B

Florida Communities Trust

Declaration of Restrictive Covenants

This document prepared by:
Kristen L. Coons, Esquire
Florida Communities Trust
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399

FLORIDA COMMUNITIES TRUST
FF8 AWARD #08-088-FF8
FCT Contract #09-CT-D1-08-F8-J1-088
THREE SISTERS SPRINGS

DECLARATION OF RESTRICTIVE COVENANTS

THIS AGREEMENT is entered into by and between the **FLORIDA COMMUNITIES TRUST** ("FCT"), a nonregulatory agency within the State of Florida Department of Community Affairs, and the **CITY OF CRYSTAL RIVER**, a local government of the State of Florida ("Recipient").

THIS AGREEMENT IS ENTERED INTO BASED ON THE FOLLOWING FACTS:

WHEREAS, the intent of this Agreement is to impose terms and conditions on the use of the proceeds of certain bonds, hereinafter described, and the lands acquired with such proceeds, as described in Exhibit "A" attached hereto and made a part hereof ("Project Site"), that are necessary to ensure compliance with applicable Florida law and federal income tax law and to otherwise implement the provisions of Sections 259.105, 259.1051 and Chapter 380, Part III, Florida Statutes;

WHEREAS, Chapter 380, Part III, Fla. Stat., the Florida Communities Trust Act, creates a non-regulatory agency within the Department of Community Affairs ("Department") that will assist local governments in bringing into compliance and implementing the conservation, recreation and open space, and coastal elements of their comprehensive plans or in conserving natural resources and resolving land use conflicts by providing financial assistance to local governments and nonprofit environmental organizations to carry out projects and activities authorized by the Florida Communities Trust Act;

WHEREAS, FCT is funded through either Section 259.105(3)(c), Fla. Stat. of the Florida Forever Act, which provides for the distribution of twenty-two percent (22%), less certain reductions, of the net Florida Forever Revenue Bond proceeds to the Department, or any other revenue source designated by the Florida Legislature, to provide land acquisition grants to local governments and nonprofit environmental organizations for the acquisition of community-based projects, urban open spaces, parks and greenways to implement local comprehensive plans;

WHEREAS, the Florida Forever Revenue Bonds are issued as tax-exempt bonds, meaning the interest on the Bonds is excluded from the gross income of bondholders for federal income tax

purposes;

WHEREAS, Rule 9K-7.009(1), Florida Administrative Code ("F.A.C."), authorizes FCT to impose conditions for funding on those FCT applicants whose projects have been selected for funding;

WHEREAS, FCT has approved the terms under which the Project Site was acquired and the deed whereby the Recipient acquired title to the Project Site. The deed shall contain such covenants and restrictions as are sufficient to ensure that the use of the Project Site at all times complies with Section 375.051, Florida Statutes and Section 9, Article XII of the State Constitution and it shall contain clauses providing for the conveyance of title to the Project Site to the Board of Trustees of the Internal Improvement Trust Fund ("Trustees") upon the failure of the Recipient to use the Project Site acquired thereby for such purposes; and

WHEREAS, the purpose of this Agreement is to set forth the covenants and restrictions that are imposed on the Project Site subsequent to disbursing FCT Florida Forever funds to the Recipient for Project Costs.

NOW THEREFORE, in consideration of the mutual covenants and undertakings set forth herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, FCT and the Recipient do hereby contract and agree as follows:

I. PERIOD OF AGREEMENT

1. This Agreement shall begin upon execution by both parties. The covenants and restrictions contained herein shall run with the Project Site and shall bind, and the benefit shall inure to, FCT and the Recipient and their respective successors and assigns.

II. MODIFICATION OF AGREEMENT

1. Either party may request modification of the provisions of this Agreement at any time. Changes which are mutually agreed upon shall be valid only when reduced to writing and duly signed by each of the parties hereto. Such amendments shall be incorporated into this Agreement.

III. RECORDING AND APPROVAL OF DECLARATION OF RESTRICTIVE COVENANTS

1. Upon execution by the parties hereto, the Recipient shall cause this Agreement to be recorded and filed in the official public records of **Citrus County, Florida**, and in such manner and in such other places as FCT may reasonably request. The Recipient shall pay all fees and charges incurred in connection therewith.

2. The Recipient and FCT agree that the State of Florida Department of Environmental Protection shall forward this Agreement to the Department of Environmental Protection Bond Counsel for review. In the event Bond Counsel opines that an amendment is required to this Agreement so that the tax-exempt status of the Florida Forever Bonds is not jeopardized, FCT and the Recipient shall amend the Agreement accordingly.

IV. NOTICE AND CONTACT

1. All notices provided under or pursuant to this Agreement shall be in writing and delivered either by hand delivery or first class, certified mail, return receipt requested, to the addresses specified below. Any such notice shall be deemed received on the date of delivery if by personal delivery or upon actual receipt if sent by registered mail.

FCT:

Florida Communities Trust
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100
ATTN: Program Manager

Recipient:

_____
_____
_____
ATTN: _____

2. In the event that a different representative or address is designated for paragraph 1. above after execution of this Agreement, notice of the change shall be rendered to FCT as provided in paragraph 1. above.

V. PROJECT SITE TITLE REQUIREMENTS IMPOSED BY CHAPTER 259, CHAPTER 375 AND CHAPTER 380, PART III, FLA. STAT.

1. Any transfer of the Project Site shall be subject to the approval of FCT and FCT shall enter into a new agreement with the transferee containing such covenants, clauses or other restrictions as are sufficient to protect the interest of the State of Florida.

2. The interest acquired by the Recipient in the Project Site shall not serve as security for any debt of the Recipient.

3. If the existence of the Recipient terminates for any reason, title to the Project Site shall be conveyed to the Trustees unless FCT negotiates an agreement with another local government, nonprofit environmental organization, the Florida Division of Forestry, the Florida Fish

and Wildlife Conservation Commission, the Department of Environmental Protection or a Water Management District who agrees to accept title and manage the Project Site.

4. In the event that the Project Site is damaged or destroyed or title to the Project Site, or any part thereof, is taken by any governmental body through the exercise or the threat of the exercise of the power of eminent domain, the Recipient shall deposit with FCT any insurance proceeds or any condemnation award and shall promptly commence to rebuild, replace, repair or restore the Project Site in such manner as is consistent with the Agreement. FCT shall make any such insurance proceeds or condemnation award moneys available to provide funds for such restoration work. In the event that the Recipient fails to commence or to complete the rebuilding, repair, replacement or restoration of the Project Site after notice from FCT, FCT shall have the right, in addition to any other remedies at law or in equity, to repair, restore, rebuild or replace the Project Site so as to prevent the occurrence of a default hereunder.

Notwithstanding any of the foregoing, FCT shall have the right to seek specific performance of any of the covenants and restrictions of this Agreement concerning the construction and operation of the Project Site.

VI. MANAGEMENT OF PROJECT SITE

1. The Project Site shall be managed only for the conservation, protection and enhancement of natural and historical resources and for compatible passive, natural resource-based public outdoor recreation, along with other related uses necessary for the accomplishment of this purpose. The proposed uses for the Project Site are specifically designated in the Management Plan approved by FCT.

2. The Recipient shall ensure that the future land use designation assigned to the Project Site is for a category dedicated to open space, conservation or outdoor recreation uses, as appropriate. If an amendment to the applicable comprehensive plan is required, the amendment shall be proposed at the next comprehensive plan amendment cycle available to the Recipient.

3. The Recipient shall ensure, and provide evidence thereof to FCT, that all activities under this Agreement comply with all applicable local, state, regional and federal laws and regulations, including zoning ordinances and the adopted and approved comprehensive plan for the jurisdiction, as applicable. Evidence shall be provided to FCT that all required licenses and permits have been obtained prior to the commencement of any construction.

4. The Recipient shall, through its agents and employees, prevent the unauthorized use of the Project Site or any use thereof not in conformity with the Management Plan approved by FCT.

5. FCT staff or its duly authorized representatives shall have the right at any time to inspect the Project Site and the operations of the Recipient at the Project Site.

6. All buildings, structures, improvements and signs shall require the prior written approval of FCT as to purpose. Further, tree removal, other than non-native species, and major land alterations shall require the written approval of FCT. The approvals required from FCT shall not be unreasonably withheld by FCT upon sufficient demonstration that the proposed structures, buildings, improvements, signs, vegetation removal or land alterations will not adversely impact the natural resources of the Project Site. FCT's approval of the Recipient's Management Plan addressing the items mentioned herein shall be considered written approval from FCT.

7. If archaeological and historic sites are located on the Project Site, the Recipient shall comply with Chapter 267, Fla. Stat. The collection of artifacts from the Project Site or the disturbance of archaeological and historic sites on the Project Site shall be prohibited unless prior written authorization has been obtained from the Department of State, Division of Historical Resources.

8. As required by Rule 9K-7.013, F.A.C., each year after FCT reimbursement of Project Costs the Recipient shall prepare and submit to FCT an annual stewardship report that documents the progress made on implementing the Management Plan.

VII. SPECIAL MANAGEMENT CONDITIONS

The Management Plan for the project site is mentioned throughout this Agreement, and is particularly described in Section IV. above. In addition to the various conditions already described in this Agreement, which apply to all sites acquired with FCT funds, the Management Plan shall address the following conditions that are particular to the project site and result from either representations made in the application that received scoring points or observations made by the FCT staff during the site visit described in Rule 9K-7.009(1), F.A.C.:

1. The future land use and zoning designations of the project site shall be changed to conservation, outdoor recreation, open space, or other similar category.

2. At least four recreational facilities, such as a canoe/kayak launching platform, fishing pier, picnic pavilions, and wildlife platforms, shall be provided. The facilities shall be developed in a manner that allows the general public reasonable access for observation and appreciation of the natural resources on the project site without causing harm to those resources.

3. The project shall provide access facilities to an existing open water shoreline, such as a canoe/kayak launching platform and fishing pier.

4. A permanent recognition sign, at a minimum size of 3' x 4', shall be maintained at the entrance area of the project site. The sign shall acknowledge that the project site was purchased with funds from the Florida Communities Trust Program and the Recipient.

6. At least 12 regularly scheduled educational classes or programs shall be provided at the project site per year. These programs shall promote the protection of environmental resources.

7. The natural communities that occur on the project site shall be preserved and appropriately managed to ensure the long-term viability of these communities.

8. The project site shall be managed in a manner that protects and enhances the listed and non-listed native wildlife species and their habitat. Periodic surveys shall be conducted of listed species using the project site.

9. The location and design of any parking facility shall be designed to have minimal impacts on natural resources. The parking area shall incorporate pervious materials wherever feasible.

10. The quality of surface waters shall be improved by the installation of stormwater facilities on the project site that provide wildlife habitat and/or open space in a park like setting. The development of the stormwater facilities shall be coordinated with and constructed by the Southwest Florida Water Management District.

11. Any proposed stormwater facility for the project site shall be designed to provide recreation open space or wildlife habitat.

12. A significant portion of the upland area on the project shall be planted with native vegetation.

13. A significant portion of the wetland area on the project shall be planted with native vegetation.

14. Exotic vegetation shall be removed from the project site.

15. An ongoing monitoring and control program for invasive vegetation including exotic (non-native) and nuisance native plant species shall be implemented at the project site. The objective of the control program shall be the elimination of invasive exotic plant species and the maintenance of a diverse association of native vegetation. The management plan shall reference the Exotic Pest Plant Council's List of Florida's Most Invasive Species to assist in identifying invasive exotics on the project site.

16. A feral animal removal program shall be developed and implemented for the project site.

17. Prior to the commencement of any proposed development activities, measures will be taken to determine the presence of any archaeological sites. All planned activities involving known archaeological sites or potential site areas shall be closely coordinated with the Division of Historical Resources in order to prevent the disturbance of these sites.

archaeological sites or potential site areas shall be closely coordinated with the Division of Historical Resources in order to prevent the disturbance of these sites. Information on significant historical and archaeological sites shall be provided to the Division of Historical Resources for the purpose of updating the Florida Master Site File.

18. A safe pedestrian sidewalk connection shall be provided between the project site and the sidewalk network in the adjacent neighborhood.

19. A nature trail of at least ¼ mile shall be provided on the project site.

20. The development and management of the project site shall be coordinated with the agencies managing the Cross Town Trail, to ensure the project site is managed as part of a linked land-based trail system.

21. Neither the Recipient nor any third party shall pump, withdraw, divert from or impound on the FCT project site ground or surface water for the purposes of commercial or industrial use.

VIII. OBLIGATIONS OF THE RECIPIENT RELATING TO THE USE OF BOND PROCEEDS

1. FCT is authorized by Section 380.510, Fla. Stat. to impose conditions for funding on the Recipient in order to ensure that the project complies with the requirements for the use of Florida Forever Bond proceeds including, without limitation, the provisions of the Internal Revenue Code and the regulations promulgated thereunder as the same pertain to tax exempt bonds.

2. The Recipient agrees and acknowledges that the below listed transactions, events, and circumstances, collectively referred to as the "disallowable activities," may be disallowed on the Project Site as they may have negative legal and tax consequences under Florida law and federal income tax law. The Recipient further agrees and acknowledges that these disallowable activities may be allowed up to a certain extent based on guidelines or tests outlined in the Federal Private Activity regulations of the Internal Revenue Service:

a. any sale or lease of any interest in the Project Site to a governmental agency or a non-governmental person or organization;

b. the operation of any concession on the Project Site by a non-governmental person or organization;

c. any sales contract or option to buy or sell things attached to the Project Site to be severed from the Project Site with a non-governmental person or organization;

d. any use of the Project Site by a non-governmental person other than in such person's capacity as a member of the general public;

e. any change in the character or use of the Project Site from that use expected at the date of the issuance of any series of Bonds from which the disbursement is to be made;

f. a management contract for the Project Site with a non-governmental person or organization; or

g. such other activity or interest as may be specified from time to time in writing by FCT to the Recipient.

3. If the Project Site, after its acquisition by the Recipient and/or the Trustees, is to remain subject to any of the disallowable activities, the Recipient shall provide notice to FCT, as provided for in paragraph III.1. above, at least sixty (60) calendar days in advance of any such transactions, events or circumstances, and shall provide FCT such information as FCT reasonably requests in order to evaluate for approval the legal and tax consequences of such disallowable activities.

4. In the event that FCT determines at any time that the Recipient is engaging, or allowing others to engage, in disallowable activities on the Project Site, the Recipient shall immediately cease or cause the cessation of the disallowable activities upon receipt of written notice from FCT. In addition to all other rights and remedies at law or in equity, FCT shall have the right to seek temporary and permanent injunctions against the Recipient for any disallowable activities on the Project Site.

DELEGATIONS AND CONTRACTUAL ARRANGEMENTS BETWEEN THE RECIPIENT AND OTHER GOVERNMENTAL BODIES, NONPROFIT ENTITIES OR NON GOVERNMENTAL PERSONS FOR USE OR MANAGEMENT OF THE PROJECT SITE WILL IN NO WAY RELIEVE THE RECIPIENT OF THE RESPONSIBILITY TO ENSURE THAT THE CONDITIONS IMPOSED HEREIN ON THE PROJECT SITE AS A RESULT OF UTILIZING BOND PROCEEDS TO ACQUIRE THE PROJECT SITE ARE FULLY COMPLIED WITH BY THE CONTRACTING PARTY.

IX. RECORDKEEPING; AUDIT REQUIREMENTS

1. The Recipient shall maintain financial procedures and support documents, in accordance with generally accepted accounting principles, to account for the receipt and expenditure of funds under this Agreement. These records shall be available at all reasonable times for inspection, review or audit by state personnel, FCT and other personnel duly authorized by FCT.

"Reasonable" shall be construed according to the circumstances, but ordinarily shall mean the normal business hours of 8:00 a.m. to 5:00 p.m., local time, Monday through Friday.

2. If the Recipient expends a total amount of State financial assistance equal to or in excess of $500,000 in any fiscal year of such Recipient, the Recipient must have a State single or project-specific audit for such fiscal year in accordance with Section 215.97, Fla. Stat., the applicable rules of the Executive Office of the Governor and the Comptroller and Chapter 10.550 (local government entities) or Chapter 10.650 (nonprofit organizations), Rules of the Auditor General. In determining the State financial assistance expended in its fiscal year, the Recipient shall consider all sources of State financial assistance, including State funds received from FCT, other state agencies and other non-state entities. State financial assistance does not include Federal direct or pass-through awards and resources received by a non-state entity for Federal program matching requirements. The funding for this Agreement was received by FCT as a grant appropriation.

In connection with the audit requirements addressed herein, the Recipient shall ensure that the audit complies with the requirements of Section 215.97(7), Fla. Stat. This includes submission of a reporting package as defined by Section 215.97(2)(d), Fla. Stat. and Chapter 10.550 (local government entities) or 10.650 (nonprofit organizations), Rules of the Auditor General.

3. If the Recipient expends less than $500,000 in State financial assistance in its fiscal year, an audit conducted in accordance with the provisions of Section 215.97, Fla. Stat. is not required. If the Recipient elects to have an audit conducted in accordance with the provisions of Section 215.97, Fla. Stat., the cost of the audit must be paid from non-State funds (i.e., the cost of such an audit must be paid from Recipient funds not obtained from a State entity).

4. The annual financial audit report shall include all management letters, the Recipient's response to all findings, including corrective actions to be taken, and a schedule of financial assistance specifically identifying all Agreement and other revenue by sponsoring agency and agreement number. Copies of financial reporting packages required under this Article shall be submitted by or on behalf of the Recipient directly to each of the following:

Department of Community Affairs (at each of the following addresses):
Office of Audit Services
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

and

Florida Communities Trust
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

State of Florida Auditor General at the following address:

Auditor General's Office
Room 401, Claude Pepper Building
111 West Madison Street
Tallahassee, Florida 32302-1450

5. If the audit shows that any portion of the funds disbursed hereunder were not spent in accordance with the conditions of this Agreement, the Recipient shall be held liable for reimbursement to FCT of all funds not spent in accordance with the applicable regulations and Agreement provisions within thirty (30) days after FCT has notified the Recipient of such non-compliance.

6. The Recipient shall retain all financial records, supporting documents, statistical records and any other documents pertinent to this Agreement for a period of five years after the date of submission of the final expenditures report. However, if litigation or an audit has been initiated prior to the expiration of the five-year period, the records shall be retained until the litigation or audit findings have been resolved.

7. The Recipient shall have all audits completed in accordance with Section 215.97, Fla. Stat. performed by an independent certified public accountant ("IPA") who shall either be a certified public accountant or a public accountant licensed under Chapter 473, Fla. Stat. The IPA shall state that the audit complied with the applicable provisions noted above.

X. DEFAULT; REMEDIES; TERMINATION

1. If any essential term or condition of the Declaration of Restrictive Covenants is violated by the Recipient or by some third party with the knowledge of the Recipient, the Recipient shall be notified of the violation by written notice given by personal delivery, registered mail or registered expedited service. The recipient shall diligently commence to cure the violation or complete curing activities within thirty (30) days after receipt of notice of the violation. If the curing activities can not be reasonably completed within the specified thirty (30) day time frame, the Recipient shall submit a timely written request to the FCT Program Manager that includes the status of the current activity, the reasons for the delay and a time frame for the completion of the curing activities. FCT shall submit a written response within thirty (30) days of receipt of the request and approval shall not be unreasonably withheld. It is FCT's position that all curing activities shall be completed within one hundred twenty (120) days of the Recipient's notification of the violation. However, if the Recipient can demonstrate extenuating circumstances exist to justify a greater extension of time to complete the activities, FCT shall give the request due consideration. If the Recipient fails to correct the violation within either (a) the initial thirty (30) day time frame or (b) the time frame approved by FCT pursuant to the Recipient's request, fee simple title to all interest in the Project Site shall be conveyed to the Trustees unless FCT negotiates an agreement with another local government, nonprofit environmental organization, the Florida Division of Forestry, the Florida Fish and Wildlife Conservation Commission, the Department of Environmental Protection or a Water

Management District, who agrees to accept title and manage the Project Site. FCT shall treat such property in accordance with Section 380.508(4)(e), Fla. Stat.

XI. STANDARD CONDITIONS

1. This Agreement shall be construed under the laws of the State of Florida, and venue for any actions arising out of this Agreement shall lie in Leon County. If any provision hereof is in conflict with any applicable statute or rule, or is otherwise unenforceable, then such provision shall be deemed null and void to the extent of such conflict and shall be severable, but shall not invalidate any other provision of this Agreement.

2. No waiver by FCT of any right or remedy granted hereunder or failure to insist on strict performance by the Recipient shall affect or extend or act as a waiver of any other right or remedy of FCT hereunder, or affect the subsequent exercise of the same right or remedy by FCT for any further or subsequent default by the Recipient.

3. The Recipient agrees to comply with the Americans With Disabilities Act (Public Law 101-336, 42 U.S.C. Section 12101 et seq.), if applicable, which prohibits discrimination by public and private entities on the basis of disability in the areas of employment, public accommodations, transportation, State and local government services, and in telecommunications.

4. A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime or on the discriminatory vendor list may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit lease bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with a public entity, and may not transact business with any public entity in excess of Category Two for a period of 36 months from the date of being placed on the convicted vendor list or on the discriminatory vendor list.

5. No funds or other resources received from FCT in connection with this Agreement may be used directly or indirectly to influence legislation or any other official action by the Florida Legislature or any state agency.

This Agreement including Exhibit "A" embodies the entire agreement between the parties.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement.

Witness:

Print Name: Andrew Houston

Elizabeth McBride
Print Name: Elizabeth McBride

CITY OF CRYSTAL RIVER, a local government of the State of Florida

By: Ronald E. Kitchen, Jr

Date: July 12, 2010

Approved as to Form and Legality:
By:
Print Name: George G. Angeliadis

STATE OF FLORIDA
COUNTY OF CITRUS

The foregoing instrument was acknowledged before me this 12th day of July, 2010, by Ronald E Kitchen Jr on behalf of the Local Government, and who is personally known to me.

Carol A. Harrington
Notary Public
Print Name: Carol A. Harrington
Commission No. DD 936013
My Commission Expires: 2/26/14

CAROL A. HARRINGTON
MY COMMISSION # DD 936013
EXPIRES: February 26, 2014
Bonded Thru Notary Public Underwriters

Witness:

Print Name: Miriam Snipes

Print Name: John T. Sirey

FLORIDA COMMUNITIES TRUST

By: Ken Reecy

Ken Reecy, Community Program Manager
Florida Communities Trust

Date: 7-20-10

Approved as to Form and Legality:
By:

Kristen L. Coons, Trust Counsel

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 20 day of July, 2010, by **Ken Reecy**, Community Program Manager, Florida Communities Trust, who is personally known to me.

Notary Public
Print Name:
Commission No.
My Commission Expires:

MIRIAM SNIPES
MY COMMISSION # DD 989658
EXPIRES: September 7, 2014
Bonded Thru Notary Public Underwriters

EXHIBIT "A"

Legal Description Parcel 15-347-123 (Three Sisters Springs)

THE PORTION OF THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4 AND THE PORTION OF THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4, ALL OF SECTION 21, TOWNSHIP 18 SOUTH, RANGE 17 EAST, CITRUS COUNTY, FLORIDA, BOUNDED AS FOLLOWS:

ON THE WEST: BY THE EAST AND SOUTH LINES OF THE LANDS DESCRIBED IN THE WARRANTY DEED RECORDED IN OFFICIAL RECORDS BOOK 1171, AT PAGE 843, OF THE PUBLIC RECORDS OF CITRUS COUNTY, FLORIDA, AND BY THE EASTERLY LINE OF THE WATERS OF THE SPRING RUN CANAL (SAID CANAL LYING EAST OF AND ADJACENT TO LOTS 1, 2 AND 3 OF PARADISE ISLE, AS SHOWN ON THE PLAT THEREOF RECORDED IN PLAT BOOK 3, AT PAGE 88, OF SAID PUBLIC RECORDS) AND BY THE NORTHERLY PROJECTION OF SAID EASTERLY LINE OF SPRING RUN CANAL WATERS TO ITS INTERSECTION WITH THE AFOREMENTIONED SOUTH LINE OF THE LANDS DESCRIBED IN OFFICIAL RECORDS BOOK 1171, AT PAGE 843;

ON THE NORTH: BY THE SOUTHERLY RIGHT-OF-WAY LINE OF S.E. KINGS BAY DRIVE (A PUBLIC RIGHT-OF-WAY 66 FEET WIDE AS GRANTED TO CITRUS COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF FLORIDA, IN THE WARRANTY DEED RECORDED IN OFFICIAL RECORDS BOOK 64, AT PAGE 144, OF SAID PUBLIC RECORDS);

ON THE EAST: BY THE WESTERLY RIGHT-OF-WAY LINE OF S.E. CUTLER SPUR BOULEVARD (A PUBLIC RIGHT-OF-WAY 100 FEET WIDE GRANTED TO THE CITY OF CRYSTAL RIVER VIA THE DEED RECORDED IN OFFICIAL RECORDS BOOK 501, AT PAGE 261, OF SAID PUBLIC RECORDS, AND FORMERLY KNOWN AS THE SEABOARD COAST LINE RAILROAD RIGHT-OF-WAY AS SHOWN ON RIGHT-OF-WAY AND TRACK MAP NO. V.5.C FL 7 DEPICTING THE HOMOSASSA BRANCH AS PREPARED BY ATLANTIC COAST LINE RAILROAD COMPANY AND DATED JUNE 30, 1917, FURTHER REFERENCED AS VALUATION MAP NO. VO6364 BY CSX REAL PROPERTY, INC.);

AND

THE PORTION OF THE NORTHWEST 1/4 OF THE NORTHEAST 1/4 AND THE PORTION OF THE NORTHEAST 1/4 OF THE NORTHEAST 1/4, ALL OF SECTION 28, TOWNSHIP 18 SOUTH, RANGE 17 EAST, CITRUS COUNTY, FLORIDA, BOUNDED AS FOLLOWS:

ON THE EAST: BY THE WESTERLY RIGHT-OF-WAY LINE OF S.E. CUTLER SPUR BOULEVARD (A PUBLIC RIGHT-OF-WAY 100 FEET WIDE GRANTED TO THE CITY OF CRYSTAL RIVER VIA THE DEED RECORDED IN OFFICIAL RECORDS BOOK 501, AT PAGE 261, OF SAID PUBLIC RECORDS, AND FORMERLY KNOWN AS THE SEABOARD

COAST LINE RAILROAD RIGHT-OF-WAY AS SHOWN ON RIGHT-OF-WAY AND TRACK MAP NO. V.5.C FL 7 DEPICTING THE HOMOSASSA BRANCH AS PREPARED BY ATLANTIC COAST LINE RAILROAD COMPANY AND DATED JUNE 30, 1917, FURTHER REFERENCED AS VALUATION MAP NO. VO6364 BY CSX REAL PROPERTY, INC.);

ON THE SOUTH: BY THE NORTHERLY LINE OF THE WATERS OF THE UNNAMED CANAL ORIENTED EAST TO WEST AND LYING AT THE NORTH END OF THE FOLLOWING SUBDIVISIONS: PRETTY SPRINGS (UNRECORDED); PRETTY SPRINGS UNIT 2 (RECORDED IN PLAT BOOK 7, PAGE 19, OF SAID PUBLIC RECORDS); PRETTY SPRINGS (RECORDED IN PLAT BOOK 5, AT PAGE 37, OF SAID PUBLIC RECORDS) AND GLEN AIRE ESTATES (UNRECORDED) AND BY THE EASTERLY PROJECTION OF SAID NORTHERLY LINE OF UNNAMED CANAL WATERS TO ITS INTERSECTION WITH THE AFOREMENTIONED WESTERLY RIGHT-OF-WAY LINE OF S.E. CUTLER SPUR BOULEVARD;

ON THE WEST: BY THE WATERS OF THE SPRING RUN CANAL (SAID CANAL LYING EAST OF AND ADJACENT TO LOTS 1, 2 AND 3 OF PARADISE ISLE, AS SHOWN ON THE PLAT THEREOF RECORDED IN PLAT BOOK 3, AT PAGE 88, OF SAID PUBLIC RECORDS) AND BY THE NORTHEASTERLY LINE OF THE WATERS OF THE SPRING RUN CANAL (SAID SPRING RUN CANAL LYING NORTHEASTERLY OF AND ADJACENT TO PALM ISLAND, AS SHOWN ON THE PLAT THEREOF RECORDED IN PLAT BOOK 4, AT PAGE 22, OF SAID PUBLIC RECORDS)

IT BEING THE SPECIFIC INTENT TO ESTABLISH AS THE SOUTHERLY, SOUTHWESTERLY AND WESTERLY BOUNDARIES OF THE LANDS HEREIN DESCRIBED, A CONTINUOUS BOUNDARY LINE ALONG THE NORTHERLY, NORTHEASTERLY AND EASTERLY LINES OF THE WATERS OF THE ABOVE DESCRIBED CONTINUOUS CANAL (UNNAMED AND SPRING RUN) AND IT BEING THE FURTHER SPECIFIC INTENT TO INCLUDE WITHIN THE LANDS HEREIN DESCRIBED THE NATURAL FEATURE KNOWN AS THREE SISTERS SPRINGS, BY VIRTUE OF THE DISCLAIMER EXECUTED BY THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA RECORDED IN OFFICIAL RECORDS BOOK 625, AT PAGE 973, OF THE PUBLIC RECORDS OF CITRUS COUNTY, FLORIDA.

END OF LEGAL DESCRIPTION

Appendix C

Intra-Service Section 7

SOUTHEAST REGION
INTRA-SERVICE SECTION 7
BIOLOGICAL EVALUATION FORM
(Federally endangered, threatened, and candidate species)

Originating Person: Andrew Gude
Phone: 352-563-2088 x202; cell 703-622-3896
Email: Andrew_Gude@fws.gov

Date: October, 2014

PROJECT NAME: **Crystal River National Wildlife Refuge**
Three Sisters Springs Management Measures

I. Service Program: **Refuges/Wildlife**

II. State/Agency: **Florida / United States Fish and Wildlife Service**

III. Station Name: **Crystal River National Wildlife Refuge**

IV. Description of Proposed Action:

The proposed action would allow the Service to implement the following management measures for the winter months November 2014 through March 2015 and will allow the Service the ability to avert the disturbance of manatees associated with watercraft and manatee viewing activities.

1) Continue to implement temporary full closures to prohibit visitation inside the entire Three Sisters Spring during extreme cold weather events.

2) Install an in-water, non-motorized vessel tie-up/disembarking area east of the Three Sisters Spring, and, prohibit vessels and large inflatable floats within the Three Sisters Spring and the spring run in order to reduce manatee disturbance and potentially unsafe encounters with swimmers.

3) Guide the public to the use the western half of the spring run extending into the Three Sisters Spring to maintain an open channel for manatee ingress and egress.

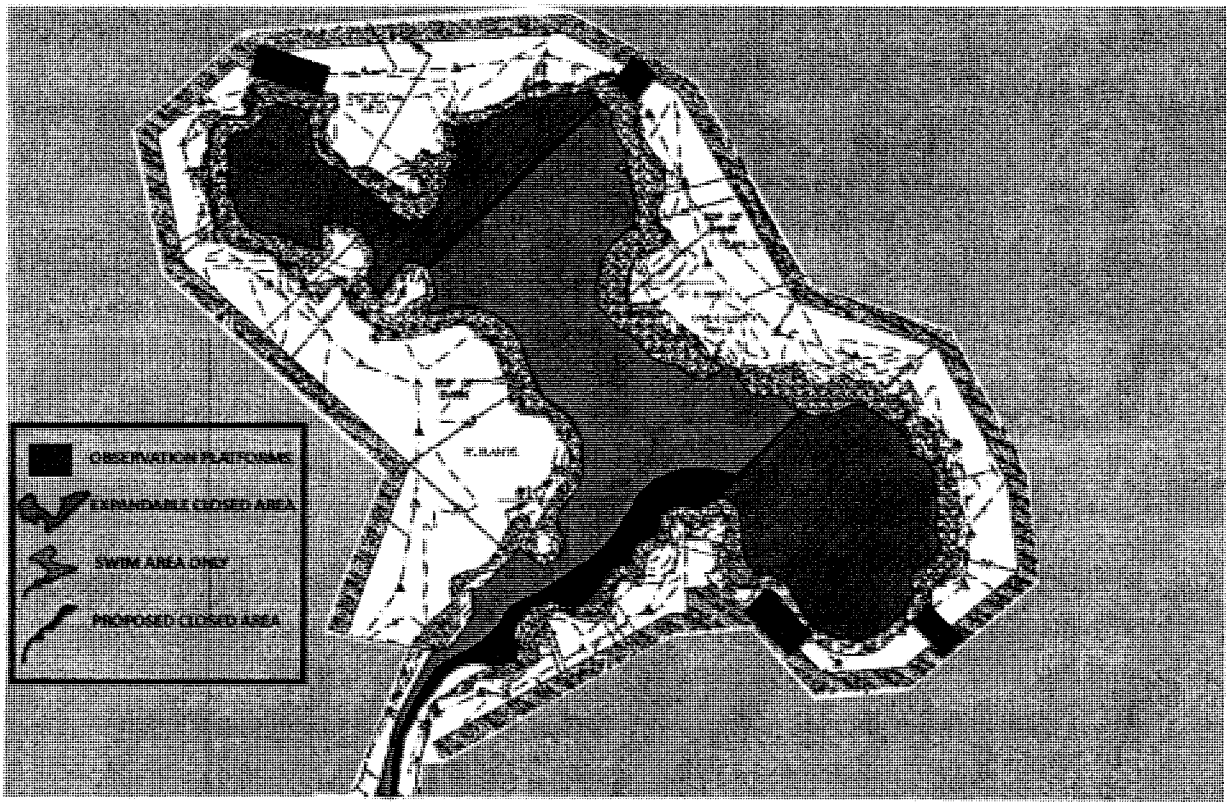
4) Create two no-entry areas within the Three Sisters Spring by closing the eastern and western lobes of the Three Sisters Spring.

5) Restrict in-water visitation to the Three Sisters Spring from 10:00 a.m. to 5:00 p.m. to provide manatees time to aggregate and rest during colder periods.

6) Require a Special Use Permit for the use of any type of flash photography inside the Three Sisters Spring. Special Use Permits for diffused flash photography will only be issued for educational or research purposes within the Three Sisters Spring.

7) Amend Special Use Permit conditions for Commercial Wildlife Observation Guides using the Three Sisters Spring to require the following specific stipulations: a City of Crystal River business license or exemption letter, in-water insurance for their clients, and an in-water guide to accompany the clients into the Three Sisters Spring.

Figure 1. Potential Management Options for the 2014-2015 Manatee Season (Proposed Alternative)



V. Pertinent Species and Habitat:

A. West Indian Manatees occur throughout the refuge's warm water spring especially during the winter months.

B. Wood Storks occur in wetland and shallow water habitats on the refuge.

C. Sea Turtles (green, Kemp's ridley, and loggerhead) are found in the marine and estuarine waters of the refuge.

D. Eastern Indigo Snakes occur on nearby Chassahowitzka NWR.

E. Gulf Sturgeon are known to occur north of Crystal River NWR in the Suwannee River.

F. American Alligators have been observed utilizing the lake within the project site.

Table 1. Listed species known to occur

SPECIES/CRITICAL HABITAT	STATUS
West Indian Manatee/Designated Critical Habitat	E
Wood Stork/Critical Habitat Not Designated	T
Green Sea Turtle/Designated Critical Habitat	E
Kemp's Ridley Sea Turtle/Critical Habitat Not Designated	E
Loggerhead Sea Turtle/Designated Critical Habitat	T
Eastern Indigo Snake/Critical Habitat Not Designated	T
Gulf Sturgeon/Designated Critical Habitat	T
American Alligator/Critical Habitat Not Designated	T(S/A)

[1]STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VI. Location (attached map):

A. **Ecoregion Number and Name:** 32-North Florida Ecosystem

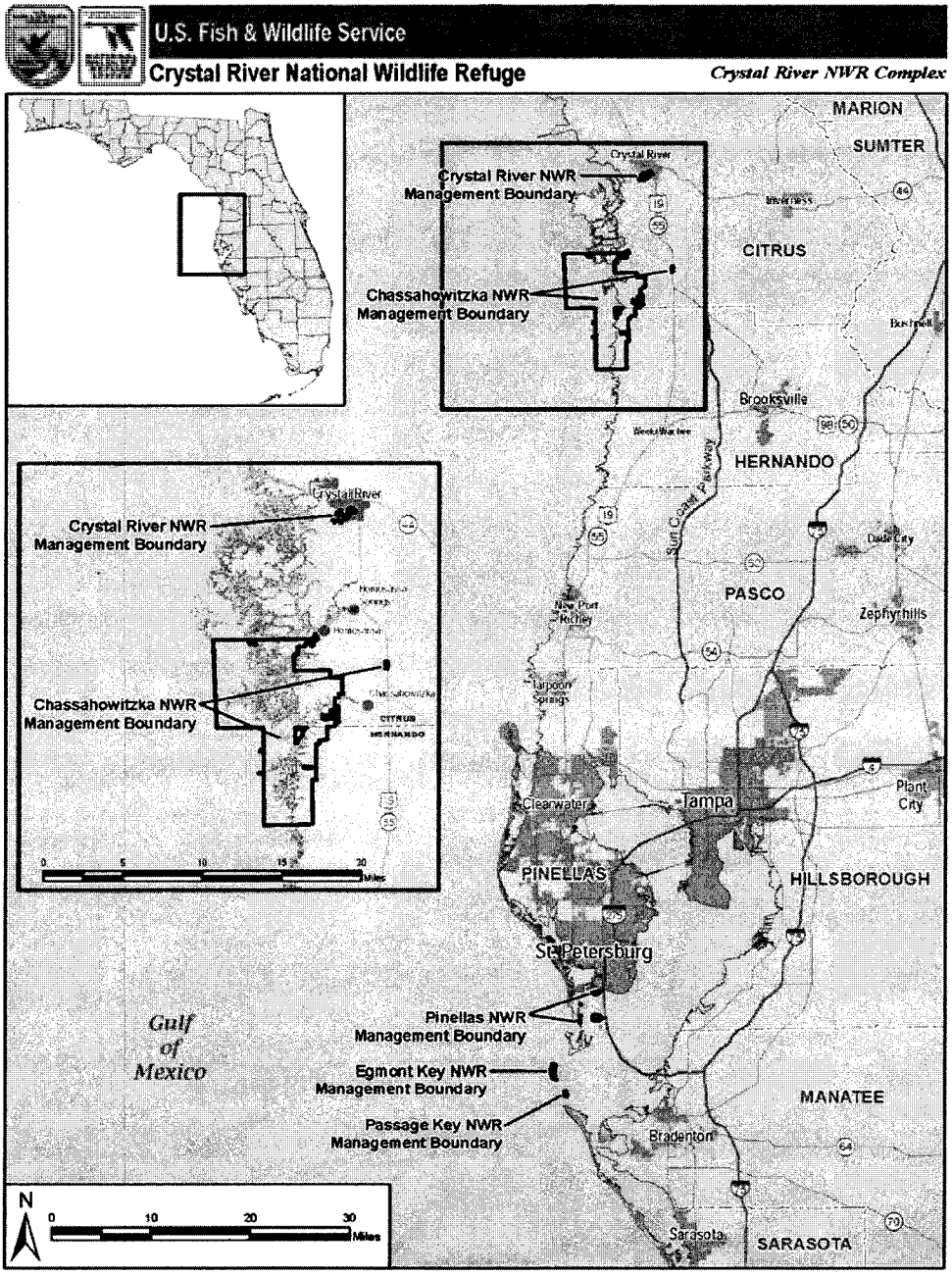
B. **County and State:** Citrus County, Florida

C. **Section, township, and range:** Section 28, Township 18S, Range 17E
Latitude: 28.88872533; Longitude: -82.58919102

D. **Distance (miles) and direction to nearest town:** within City of Crystal River, Florida city limits

E. **Crystal River National Wildlife Refuge Location:**

Figure 2: Location Map



VII. Determination of effects

A. Explanation of effects of the action on species and critical habitats and mitigation:

Table 2. Project impacts to listed/proposed species/critical habitat and actions to mitigate or minimize impacts. NOTE: Please see attached documentation as well.

Species/Critical Habitat	Effects on Species and Critical Habitat, Mitigation
West Indian manatee	Manatees utilize Crystal River NWR year-round with significantly higher numbers during the colder winter months. The Kings Bay springs are one of the most important natural warm-water habitats for manatees. Key habitat-related concerns for the Northwest subpopulation include: spring flow rates, water quality and submerged aquatic vegetation, storm-related impacts on habitat and adult survival, aquatic plant control activities, toxins, pathogens, and human disturbance at warm water springs. The greatest threats to manatee survival in Florida are collisions with boats and loss of warm water habitat. Other threats to manatees include declines in water and habitat quality, habitat loss, loss of natural springs and spring flows due to human development and demand for water, flood gates and canal locks, monofilament fishing line and other discarded trash, float lines, anchor and mooring lines, red tide blooms, and harassment. Promote passive wildlife observation and implement proposed alternative. Actions will not affect designated critical habitat.

Species/Critical Habitat	Effects on Species and Critical Habitat, Mitigation
Wood Stork	Wood storks are large wading birds that use a unique grope-feeding technique (tacto-location) which requires specific water levels and food densities. Although wood storks are not known to breed on Crystal River NWR, they regularly utilize the various shallow aquatic habitats available for feeding, with more use occurring during the winter. Up to 23 wood storks are known to regularly use Parker Island during the winter. Because this species is not known to frequent Three Sisters Springs, the likelihood of disturbance is low.
Green Sea Turtle	Green turtles are found during the day in shallow flats and seagrass meadows and return every evening to their usual sleeping quarters- scattered rock ledges, oyster bars, and coral reefs. Adult green turtles are unique among sea turtles in that they are largely vegetarians, consuming primarily seagrasses and algae. Approximately 100 to 1,000 green turtles nest on Florida's beaches each year from June through late September. Because this species is not known to frequent Three Sisters Springs, the likelihood of disturbance is low. Actions will not affect designated critical habitat.

Species/Critical Habitat	Effects on Species and Critical Habitat, Mitigation
Kemp's Ridley Sea Turtle	Outside of nesting, the major habitat for Kemp's ridleys is the nearshore and inshore waters of the northern Gulf of Mexico. Adult and sub-adult Kemp's ridleys primarily occupy nearshore habitats that contain muddy or sandy bottoms where prey can be found. Kemp's ridley hatchlings and small juveniles inhabit a very different environment than adults. After emerging from the nest, hatchlings enter the water and quickly swim offshore to open ocean developmental habitat where they associate with floating Sargassum seaweed. They passively drift within the Sargassum, feeding on a wide variety of floating items. Some of these juvenile turtles remain within Gulf of Mexico currents while others are swept out of the Gulf and into the Atlantic Ocean by the Gulf Stream. This developmental period is estimated to last approximately 2 years or until the turtles reach a carapace length of about 8 inches, at which time these sub-adult turtles return to neritic zones of the Gulf of Mexico or northwestern Atlantic by the Gulf Stream. This developmental period is estimated to last approximately 2 years or until the turtles reach a carapace length of about 8 inches, at which time these sub-adult turtles return to neritic zones of the Gulf of Mexico or northwestern Atlantic Ocean where they feed and continuing growing until they reach maturity. Because this species is not known to frequent Three Sisters Springs the likelihood of disturbance is low. Critical habitat has not been designated for this species; therefore critical habitat will not be affected.

Species/Critical Habitat	Effects on Species and Critical Habitat, Mitigation
Loggerhead Sea Turtle	Loggerheads may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and shipwrecks are often used as feeding areas. Nesting occurs mainly on open beaches or along narrow bays having suitable sand, and they are often in association with other species of sea turtles. Most loggerhead hatchlings originating from U.S. beaches are believed to lead a pelagic existence in the North Atlantic gyre for an extended period of time, perhaps as long as 7 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Because this species is not known to frequent Three Sisters Springs, the likelihood of disturbance is low. Actions will not affect designated critical habitat.
Eastern Indigo Snake	Over most of its range, the eastern indigo snake frequents several habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. Eastern indigo snakes need a mosaic of habitats to complete their annual cycle. Interspersion of tortoise-inhabited sandhills and wetlands improves habitat quality for this species. Eastern indigo snakes require sheltered retreats from winter cold and desiccating conditions. Because this species is not known to frequent Three Sisters Springs, the likelihood of disturbance is low. Critical habitat has not been designated for this species; therefore critical habitat will not be affected.

Species/Critical Habitat	Effects on Species and Critical Habitat, Mitigation
Gulf Sturgeon	The Gulf sturgeon's historic range extended well south of Crystal River NWR to Charlotte Harbor, near Fort Myers, Florida. Critical habitat was designated as far south as the Suwannee River. Very little work has been done to determine where the Gulf sturgeon goes after breeding in the Suwannee River. The Gulf sturgeon is known to occur north of Crystal River in the Suwannee River; it is suspected to occur on Crystal River NWR. Because this species is not known to frequent Three Sisters Springs the likelihood of disturbance is low. Actions will not affect designated critical habitat.
American Alligator	Small numbers of alligators are usually seen in the canals outside Three Sisters Springs. One alligator has been observed utilizing the lake within the project site. Alligators may utilize the springs when visitor numbers are reduced. Because this species is not known to frequent Three Sisters Springs the likelihood of disturbance is low. Critical habitat has not been designated for this species; therefore critical habitat will not be affected.

VIII. Effect Determination and Response Requested:

Table 3. The effect determination and response requested for Impact to each proposed/listed species/critical habitat.

Species	Critical Habitat	Determination			Response Requested
		NE	NA	A	
West Indian manatee	X	X			
Wood Stork		X			
Green Sea Turtle	X	X			
Kemp's Ridley Sea Turtle		X			
Loggerhead Sea Turtle	X	X			
Eastern Indigo Snake		X			
Gulf Sturgeon	X	X			
American Alligator		X			

NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but a "Concurrence" is recommended for a complete Administrative Record.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources.
Response Requested is a "Concurrence"

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is "Formal Consultation". Response requested for proposed and candidate species is "Conference".

Kimberly J Syfu
Signature
Acting Refuge Manager

10/16/14
Date

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence ✓ **Non-concurrence** _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

Jay B. Herrington
Field Supervisor, NFESO

10-17-2014

Signature
Field Supervisor

Date

From:	Kanaski, Richard
To:	Kimberly Sykes
Cc:	Richard Warner
Subject:	Re: Approval for manatee wildlife viewing activities proposed actions at Three Sisters Springs
Date:	Thursday, October 23, 2014 10:20:44 AM

Kimberly & Richard: see if this works for the EA.

Rick

The proposed and/or on-going temporary measures deal with managing human-manatee interactions in the Three Sisters Springs and adjacent waters. None of the measures involve any type of ground disturbances or construction that would trigger Section 106 of the National Historic Preservation Act and subsequently necessitate consultation with the Florida Division of Cultural Resources, the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, the Seminole Nation of Oklahoma, the Muscogee (Creek) Nation, and the Poarch Band of Creeks. The recent Section 106 review for proposed public use infrastructure projects on the uplands adjacent to the springs did not reveal any recorded historic properties in the general vicinity. The review demonstrated that much of the area had been substantially disturbed by past canal construction and the associated residential development. The potential for intact archaeological sites in the springs and the surrounding waters is considered to be very low. These measures pose no risk to historic properties on the Refuge.

On Wed, Oct 22, 2014 at 3:32 PM, Kanaski, Richard <richard_kanaski@fws.gov> wrote:

> Kimberly - Richard & I spoke at length today regarding this specific issue. The measures that you have provided will be adequate for my review and input. Thanks.
>
> Rick
>
> On Wed, Oct 22, 2014 at 3:15 PM, Kimberly Sykes <kimberly_sykes@fws.gov> wrote:
>
> > Hey Rick
> >
> > Richard and I are working on the EA for the proposed management actions to be implemented in the warm water springs located at Three Sisters Springs. I spoke with Richard regarding Section 106 clearance and he recommended I email you with the proposed actions. They are as follows:

1) Continue to implement temporary full closures to prohibit visitation inside the warm water springs located at Three Sisters Springs during extreme cold weather events and violations of the 12 prohibitions identified by the Kings Bay Manatee Protection Area Rule.

2) Install an in-water, non-motorized vessel tie-up/disembarking area east of the warm water spring located at Three Sisters Springs, and prohibit vessels and large inflatable floats within the spring heads as well as the spring run in order to reduce manatee disturbance and potentially unsafe encounters with swimmers.

3) Guide the public to use the western half of the spring run extending into the warm water spring heads located atThree Sisters Spring to maintain an open channel for manatee ingress and egress.

4) Create two expanded no-public entry areas within the spring heads by closing the eastern and western lobes known as pretty sister and little sister located on Three Sisters Springs.

5) Restrict in-water visitation to the warm water springs locate at Three Sisters Springs from 10:00 a.m. to 5:00 p.m. to provide manatees time to aggregate and rest.

6) Require a Special Use Permit for the use of any type of flash photography inside the warm water spring at Three Sisters Springs. Special Use Permits for diffused flash photography will only be issued for educational or research purposes.

7) Amend Special Use Permit conditions for Commercial Wildlife Observation Guides using the warm water springs at Three Sisters Spring to require the following specific stipulations: a City of Crystal River business license or exemption letter, in-water insurance for their clients, and an in-water guide to accompany the clients into the Three Sisters Spring.

What other information do you need for clearance at your end??

Thanks

Kimberly

Kimberly L. Sykes

Deputy Manager

Crystal River NWR Complex

1502 S.E. Kings Bay Drive

Crystal River, FL 34429

(352) 563-2088 ext 205

(352) 586-9358 cell

--
Richard S. Kanaski, Regional Historic Preservation Officer &
Regional Archaeologist
U.S. Fish and Wildlife Service, Southeast Region
(843) 784-6310 [Office]
(912) 257-5434 [Cell]
richard_kanaski@fws.gov

--
Richard S. Kanaski, Regional Historic Preservation Officer &
Regional Archaeologist
U.S. Fish and Wildlife Service, Southeast Region
(843) 784-6310 [Office]
(912) 257-5434 [Cell]
richard_kanaski@fws.gov

Appendix D

Passive Wildlife Observation/Photography Guidelines

And

Kings Bay Manatee Protection Area Rule

Passive Wildlife Observation and Photography Guidelines

- There are other things you can do that will improve the quality of your experience and reduce impacts to manatees and other visitors. By following these simple guidelines, you will prevent manatee harassment and disturbance while increasing your opportunity to see manatees up close.
- When you are ready to get in the water, remember that you are about to enter the manatee's home.
- Make sure there is a dive flag within 100' of where you'll be swimming.
- Enter the water quietly and slowly to keep from scaring manatees and stirring up the bottom. Unnecessary splashing can disturb manatees and stir up sediment, reducing visibility.
- Keep your feet/fins off the bottom, especially in shallow areas, to maintain visibility.
- Always keep calm, reduce splashing or excessive noise as much as possible.
- When approaching the springs, swim as quietly and slowly as possible, keeping legs, arms, hands and fin movements to a minimum and below the water's surface to prevent splashing.
- A wetsuit and snorkel gear is highly recommended, especially during the winter months.
- Snorkel gear improves your ability to see manatees, and will prevent you from accidentally swimming over or into manatees.
- Always give manatees the right of way and do not block or intercept a manatee as it moves or surfaces to breathe.
- Avoid swimming over manatees or hovering over them. Swimming over or hovering over manatees can easily disturb them, particularly those found resting, nursing or feeding.
- Don't approach a mating herd. Although manatees aren't aggressive, approaching a herd can be dangerous for swimmers.
- The sound of bubbles generated by scuba gear may disturb manatees. Avoid approaching any manatee while wearing scuba gear.
- Remember, you are responsible for your children. Make sure that they understand the rules for swimming with manatees and never leave them unattended while in the water.
- Practice passive observation. By using this technique, the likelihood of harassing or disturbing a manatee is significantly reduced, and manatees are more likely to approach you.
- Your actions affect the behavior of other visitors around you; so it is always best to be the example, especially when around children.
- Do not approach newborn manatees (manatees between 1 day old and 2 months).

- Photography is limited to point and shot cameras without extension poles only – remote control equipment is prohibited. Commercial photography is prohibited without a special use permit.
- No vegetation should be cleared, trimmed, or disturbed.
- The use of “rapid fire” photography, more than one flash shot every five seconds, is prohibited.
- Video recording and/or photography with the use of constant lighting is prohibited.
- Photographers and videographers are encouraged to remain calm and move slowly when in the water, and avoid the use of artificial lighting when filming manatees.
- Excessive movement disturbs sediment on the floor of the springs and bay, which reduces your and other visitors’ visibility.

- When breaking the surface, it is best to vertically descend while squatting down
- Please avoid a head-first descend. Head-first submersion typically results in a diagonal descent and may cause manatee disturbance.
- While photographers may submerge to photograph manatees, be aware that diving down on a resting or feeding manatee is prohibited within Kings Bay.
- Although it’s tempting to get very close or even follow manatees to get the perfect shot, these actions can quickly elevate into harassment.
- Always be aware of your behavior around manatees and the manatees’ behavior around you.
- Remember, holding a Special Use Permit does not allow you to harass or change the natural behavior of a manatee in any way.

Psydrax odorata, *Sida fallax*, *Sophora chrysophylla*, or *Waltheria indica;* and

(ii) Elevations between 29 and 128 m (94 and 420 ft).

(2) *Ferns and allies*.

FAMILY ASPLENIACEAE: ***Asplenium fragile*** VAR. ***insulare*** (NCN)

Hawaii 24—*Asplenium fragile* var. *insulare*—a, identified in the legal description in paragraph (k) of this section, constitutes critical habitat for *Asplenium fragile* var. *insulare* on Hawaii. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) *Metrosideros polymorpha* dry montane forest; *Dodonaea viscosa* dry montane shrubland; *Myoporum sandwicense-Sophora chrysophylla* dry montane forest; *Metrosideros polymorpha-Acacia koa* forest; or subalpine dry forest and shrubland with large, moist lava tubes (3.05 to 4.6 m (10 to 15 ft) in diameter), pits, deep cracks, and lava tree molds that have at least a moderate soil or ash accumulation or that are at the interface between younger aa lava flows and much older pahoehoe lava or ash deposits with a fairly consistent microhabitat (areas that are moist and dark); and containing one or more of the following associated native plant species: *Leptecophylla tameiameiae*, *Phyllostegia ambigua*, *Vaccinium reticulatum*, mosses, or liverworts; and

(ii) Elevations between 1,313 and 2,194 m (4,306 and 7,198 ft).

FAMILY ASPLENIACEAE: ***Diellia erecta*** (ASPLENIUM-LEAVED DIELLIA)

Hawaii 17—*Diellia erecta*—a and Hawaii 18—*Diellia erecta*—b, identified in the legal descriptions in paragraph (k) of this section, constitute critical habitat for *Diellia erecta* on Hawaii. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) *Metrosideros polymorpha-Nestegis sandwicensis* lowland mesic forest containing one or more of the following associated native plant species: *Antidesma platyphyllum*, *A. pulvinatum*, *Diospyros sandwicensis*, *Microlepia* sp., *Nephrolepis* spp. *Nestegis sandwicensis*, *Psydrax odorata*, *Wikstroemia phillyreifolia*, or *Wikstroemia sandwicensis;* and

(ii) Elevations between 510 and 981 m (1,672 and 3,217 ft).

FAMILY GRAMMITIDACEAE: ***Adenophorus periens*** (PENDENT KIHI FERN)

Hawaii 28—*Adenophorus periens*—a, identified in the legal description in paragraph (k) of this section, constitutes critical habitat for *Adenophorus periens* on Hawaii. Within this unit, the currently known primary constituent elements of critical habitat include but are not limited to, the habitat components provided by:

(i) Epiphytic on *Metrosideros polymorpha* or *Ilex anomala*, or possibly other native tree trunks, in *Metrosideros polymorpha-Cibotium glaucum* lowland wet forest containing one or more of the following associated native plant species: *Broussasia arguta*, *Cheirodendron trigynum*, *Cyanea* sp., *Cyrtandra* sp., *Dicranopteris linearis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia hirtella*, *Machaerina angustifolia*, *Psychotria hawaiiensis*, or *Psychotria* sp.; and

(ii) Elevations between 675 and 921 m (2,215 and 3,021 ft).

[68 FR 9241, Feb. 27, 2003, as amended at 68 FR 13055, Mar. 18, 2003; 68 FR 26038, May 14, 2003; 68 FR 28072, May 22, 2003; 68 FR 36080, June 17, 2003; 68 FR 39704, July 2, 2003; 77 FR 57767, Sept. 18, 2012]

Subpart J—Manatee Protection Areas

SOURCE: 44 FR 60964, Oct. 22, 1979, unless otherwise noted.

§ 17.100 Purpose.

This subpart provides a means for establishing manatee protection areas without waters under the jurisdiction of the United States, including coastal waters adjacent to and inland waters within the several States, within which certain waterborne activities will be restricted or prohibited for the purpose of preventing the taking of manatees.

§ 17.101 Scope.

This subpart applies to the West Indian manatee (*Trichechus manatus*), also known as the Florida manatee and as the sea cow. The provisions of this subpart are in addition to, and not in lieu of, other regulations contained in this chapter I which may require a permit or prescribe additional restrictions on the importation, exportation, transportation, or taking of wildlife, and the regulations contained in title 33, CFR, which regulate the use of navigable waters.

§ 17.102 Definitions.

In addition to definitions contained in the Acts, part 10 of this subchapter, and §17.3 of this part, and unless the context otherwise requires, in this subpart:

Acts means the Endangered Species Act of 1973, as amended (87 Stat. 884, 16 U.S.C. 1531–1543) and the Marine Mammal Protection Act of 1972, as amended (86 Stat. 1027, 16 U.S.C. 1361–1407);

Authorized officer means any commissioned, warrant, or petty officer of the U.S. Coast Guard, or any officer or agent designated by the Director of the U.S. Fish and Wildlife Service, the Secretary of the Interior, the Secretary of Commerce, or the Secretary of the Treasury, or any officer designated by the head of a Federal or State agency which has entered into an agreement with the Secretary of the Interior, Secretary of Commerce, Secretary of the Treasury, or Secretary of Transportation to enforce the Acts, or any Coast Guard personnel accompanying and acting under the direction of a person included above in this definition;

Idle speed is defined as the minimum speed needed to maintain steerage (direction) of the vessel;

Manatee protection area means a manatee refuge or a manatee sanctuary;

Manatee refuge means an area in which the Director has determined that certain waterborne activity would result in the taking of one or more manatees, or that certain waterborne activity must be restricted to prevent the taking of one or more manatees, including but not limited to a taking by harassment;

Manatee sanctuary means an area in which the Director has determined that any waterborne activity would result in a taking of one or more manatees, including but not limited to a taking by harassment;

Planing means riding on or near the water's surface as a result of the hydrodynamic forces on a water vehicle's hull, sponsons, foils, or other surfaces. A water vehicle is considered on plane when it is being operated at or above the speed necessary to keep the vessel planing;

Slow speed is defined as the speed at which a water vehicle proceeds when it is fully off plane and completely settled in the water. Due to the different speeds at which water vehicles of different sizes and configurations may travel while in compliance with this definition, no specific speed is assigned to slow speed. A water vehicle is *not* proceeding at slow speed if it is: on a plane; in the process of coming up on or coming off of plane; or creating an excessive wake. A water vehicle *is* proceeding at slow speed if it is fully off plane and completely settled in the water, not creating an excessive wake;

Slow speed (channel exempt) means that the slow-speed designation does not apply to those waters within the maintained, marked channel;

Slow speed (channel included) means that the slow-speed designation applies both within and outside the designated channel;

Wake means all changes in the vertical height of the water's surface caused by the passage of a water vehicle, including a vessel's bow wave, stern wave, and propeller wash, or a combination thereof;

Waterborne activity includes, but is not limited to, swimming, diving (including skin and scuba diving), snorkeling, water skiing, surfing, fishing, the use of water vehicles, and dredging and filling operations;

Water vehicle, *watercraft*, and *vessel* include, but are not limited to, boats (whether powered by engine, wind, or other means), ships (whether powered by engine, wind, or other means), barges, surfboards, personal watercraft, water skis, or any other device or mechanism the primary or an incidental purpose of which is locomotion

on, or across, or underneath the surface of the water.

[44 FR 60964, Oct. 22, 1979, as amended at 67 FR 693, Jan. 7, 2002]

§ 17.103 Establishment of protection areas.

The Director may, by regulation issued in accordance with 5 U.S.C. 553 and 43 CFR part 14, establish manatee protection areas whenever there is substantial evidence showing such establishment is necessary to prevent the taking of one or more manatees. Any regulation establishing a manatee protection area shall state the following information:

(a) Whether the area is to be a manatee sanctuary or refuge.

(1) If the area is to be a manatee sanctuary, the regulation shall state that all waterborne activities are prohibited.

(2) If the area is to be a manatee refuge, the regulation shall state which, if any, waterborne activities are prohibited, and it shall state the applicable restrictions, if any, on permitted waterborne activities.

(b) A description of the area sufficient enough so that its location and dimensions can be readily ascertained without resort to means other than published maps, natural or man-made physical reference points, and posted signs.

(c) Whether the designation is to remain in effect year-round, and if not, the time of year it is to remain in effect.

§ 17.104 Prohibitions.

Except as provided in § 17.105,

(a) *Manatee sanctuary*. It is unlawful for any person to engage in any waterborne activity within a manatee sanctuary.

(b) *Manatee refuge*. It is unlawful for any person within a particular manatee refuge to engage in any waterborne activity which has been specifically prohibited within that refuge, or to engage in any waterborne activity in a manner contrary to that permitted by regulation within that area. Any take of manatees under the Acts (see § 18.3 of this chapter for a definition of ''take'' in regard to marine mammals), including take by harassment, is prohibited wherever it may occur.

(c) *State law*. It is unlawful for any person to engage in any waterborne activity prohibited by, or to engage in any waterborne activity in a manner contrary to that permitted by, any State law or regulation the primary purpose of which is the protection of manatees: *Provided:* that such State law or regulation has been issued as part of a program which is determined to be in accordance with the Endangered Species Act of 1973, pursuant to section 6(c) of that Act (16 U.S.C. 1535(c)) or has been approved as consistent with the Marine Mammal Protection Act of 1972 in accordance with section 109 of that Act (16 U.S.C. 1379) and 50 CFR 18.53.[1]

[44 FR 60964, Oct. 22, 1979, as amended at 77 FR 15631, Mar. 16, 2012]

§ 17.105 Permits and exceptions.

(a) The Director may issue permits allowing the permittee to engage in any activity otherwise prohibited by this subpart. Such permits shall be issued in accordance with the provisions of § 17.22 of this part. Such permits shall be issued only for scientific purposes or for the enhancement of propagation or survival. All of the provisions of § 17.22 shall apply to the issuance of such permits, including those provisions which incorporate other sections by reference. Compliance with this paragraph does not by itself constitute compliance with any applicable requirements of part 18.

(b) Any authorized officer may engage in any activity otherwise prohibited by this subpart if:

(1) The officer is acting in the performance of his or her official duties; and

(2) The activity is being conducted to directly protect any manatees, to enhance the propagation or survival of manatees, or is reasonably required to enforce the other provisions of this subpart.

[1] EDITORIAL NOTE: Section 18.53 was removed at 48 FR 22456, May 18, 1983. See the note at part 18, subpart F.

(c) Any person may engage in any activity otherwise prohibited by this subpart if such activity is reasonably necessary to prevent the loss of life or property due to weather conditions or other reasonably unforeseen circumstances, or to render necessary assistance to persons or property.

(d) Any waterborne activity which would otherwise be prohibited by this subpart may be engaged in if it is conducted by or under a contract with a Federal agency and if the Secretary of Defense, in accordance with section 7(j) of the Endangered Species Act of 1973 (16 U.S.C. 1536(j)) makes a finding that such activity is necessary for reasons of national security. Such a finding must be made prior to the beginning of the activity or the designation of the protection area, whichever occurs later; except that in the case of an emergency establishment of a protection area under §17.106, the finding must be made within 10 days after the beginning of the activity or the designation of the protection area, whichever occurs later.

§ 17.106 Emergency establishment of protection areas.

(a) The Director may establish a manatee protection area under the provisions of paragraphs (b) and (c) of this section at any time he determines there is substantial evidence that there is imminent danger of a taking of one or more manatees, and that such establishment is necessary to prevent such a taking.

(b) The establishment of a manatee protection area under this section shall become effective immediately upon completion of the following requirements:

(1) Publication of a notice containing the information required by §17.103 of this section in a newspaper of general circulation in each county, if any, in which the protection area lies; and

(2) Posting of the protection area with signs clearly marking its boundaries.

(c) Simultaneously with the publication required by paragraph (b) of this section, the Director shall publish the same notice in the FEDERAL REGISTER. If simultaneous publication is impractical, because of the time involved or the nature of a particular emergency situation, failure to publish notice in the FEDERAL REGISTER simultaneously shall not delay the effective date of the emergency establishment. In such a case, notice shall be published in the FEDERAL REGISTER as soon as possible.

(d) No emergency establishment of a protection area shall be effective for more than 120 days. Termination of an emergency establishment of a protection area shall be accomplished by publishing notice of the termination in the FEDERAL REGISTER and in a newspaper of general circulation in each county, if any, in which the protection area lies.

(e) Within 10 days after establishing a protection area in accordance with this section, the Director shall commence proceedings to establish the area in accordance with §17.103.

§ 17.107 Facilitating enforcement.

Water vehicles operating in manatee sanctuary or refuge waters are subject to boarding and inspection for the purpose of enforcing the Acts and these regulations.

(a) The operator of a water vehicle shall immediately comply with instructions issued by authorized officers to facilitate boarding and inspection of the water vehicle.

(b) Upon being approached by an authorized officer, the operator of a water vehicle shall be alert for signals conveying enforcement instructions.

(c) A water vehicle signaled for boarding shall:

(1) Guard channel 16, VHF-FM, if equipped with a VHF-FM radio;

(2) Stop immediately and lay to or maneuver in such a manner as to facilitate boarding by the authorized officer and his or her party;

(3) When necessary to facilitate the boarding, provide a safe ladder, manrope, safety line and illumination of the ladder; and

(4) Take such other actions as may be necessary to ensure the safety of the authorized officer and his or her party and to facilitate the boarding and inspection.

(d) It is unlawful for any person to assault, resist, oppose, impede, intimidate, or interfere with any authorized officer or member of his or her party.

§ 17.108 List of designated manatee protection areas.

(a) *Manatee sanctuaries.* The following areas are designated as manatee sanctuaries. All waterborne activities are prohibited in these areas during the period November 15–March 31 of each year. The areas which will be posted are described as follows:

(1) That part of Kings Bay, Crystal River, Citrus County, within T. 18 S., R. 17 E., Tallahassee Meridian; located in SW¼ fractional section 28, more particularly described as follows:

Beginning at Corner 1 (N–1,653,459/E–308,915) Florida Coordinate System, West Zone, a point on the shoreline of Kings Bay near the southwest corner of Lot 9 as accepted on a plat by the Department of the Interior, General Land Office, dated January 10, 1928; thence easterly, along said shoreline, approximately 1240 feet to Corner 2 (N–1,653,762/E/309,641) a point; thence S. 56°58′11″ W., across open water, 776.49 feet to Corner 3 (N–1,653,339/E–308,990) a point; thence N. 32°03′07″ W., across open water, 142.26 feet to the point of beginning, containing 3.41 acres, more or less, to be known as the Banana Island Sanctuary.

(2) That part of Kings Bay, Crystal River, Citrus County, Florida, within T. 18 S., R. 17 E., Tallahassee Meridian; located in SW¼ fractional section 28, more particularly described as follows:

Beginning at Corner 1 (N–1,652,684/E–309,396) Florida Coordinate System, West Zone, a point on the shoreline of Kings Bay, said point being the northwest corner of Lot 31 Sunset Shores Addition to Woodward Park (Plat Book 2, page 140 Citrus County Property Appraiser's Office); thence N. 35°05′33″ W., across open water, 439.10 feet to Corner 2 (N–1,653,043/E–309,144) a point; thence N. 67°23′28″ E., across open water, 873.45 feet to Corner 3, a point on the shoreline of Kings Bay said point also being a corner in the northerly boundary line of Lot 21 in said subdivision; thence southwesterly along said shoreline and the northerly boundary of Lots 21–31, including a canal, approximately 920 feet to the point of beginning, containing 5.62 acres, more or less, to be known as the Sunset Shores Sanctuary.

(3) A tract of submerged land, lying in Sections 21 and 28, Township 18 South, Range 17 East in Citrus County, Florida, more particularly described as follows: All of the submerged land lying within the mean high water line of a canal bordering the western, northern, and eastern sides of Paradise Isle Subdivision, as recorded in Plat Book 3, Page 88 of the Public Records of Citrus County, Florida; bounded at the western exit by a line drawn between the southwestern corner of Lot 7 of said Paradise Isle Subdivision and the southeastern corner of Lot 22 of Springs O'Paradise Subdivision, Unit No. 3, as recorded in Plat Book 3, Page 70 of said Public Records; and bounded at the eastern exit by an easterly extension of the south boundary of said Paradise Isle Subdivision; Containing 3.4 acres, more or less, to be known as the Magnolia Springs Manatee Sanctuary.

(4) A tract of submerged land, lying in Sections 28 and 29, Township 18 South, Range 17 East in Citrus County, Florida, more particularly described as follows: For a point of reference, commence at the southwest corner of said Section 28; Then go N 06°01′23″ W for 4466.90 feet to a 10-inch diameter concrete monument marking the Point of Beginning; Then go N 10°05′38″ W for 477.32 feet to a 10-inch diameter concrete monument with an attached buoy; Then go N 37°34′41″ E for 651.07 feet to a 10-inch diameter concrete monument with an attached buoy; Then go S 73°26′46″ E for 634.10 feet to a 10-inch diameter concrete monument with an attached buoy; Then go S 17°50′16″ E for 1691.53 feet to a 10-inch diameter concrete monument with an attached buoy; Then go S 71°48′58″ W for 117.87 feet to a 10-inch diameter concrete monument with an attached buoy; Then continue S 71°48′58″ W for 5 feet more or less to the mean high water line of Buzzard Island; Then follow said mean high water line northerly and westerly to a point lying S 10°05′38″ E of the point of beginning; Then go N 10°05′38″ W for 5 feet more or less to the point of beginning; Containing 18.0 acres, more or less, to be known as the Buzzard Island Manatee Sanctuary.

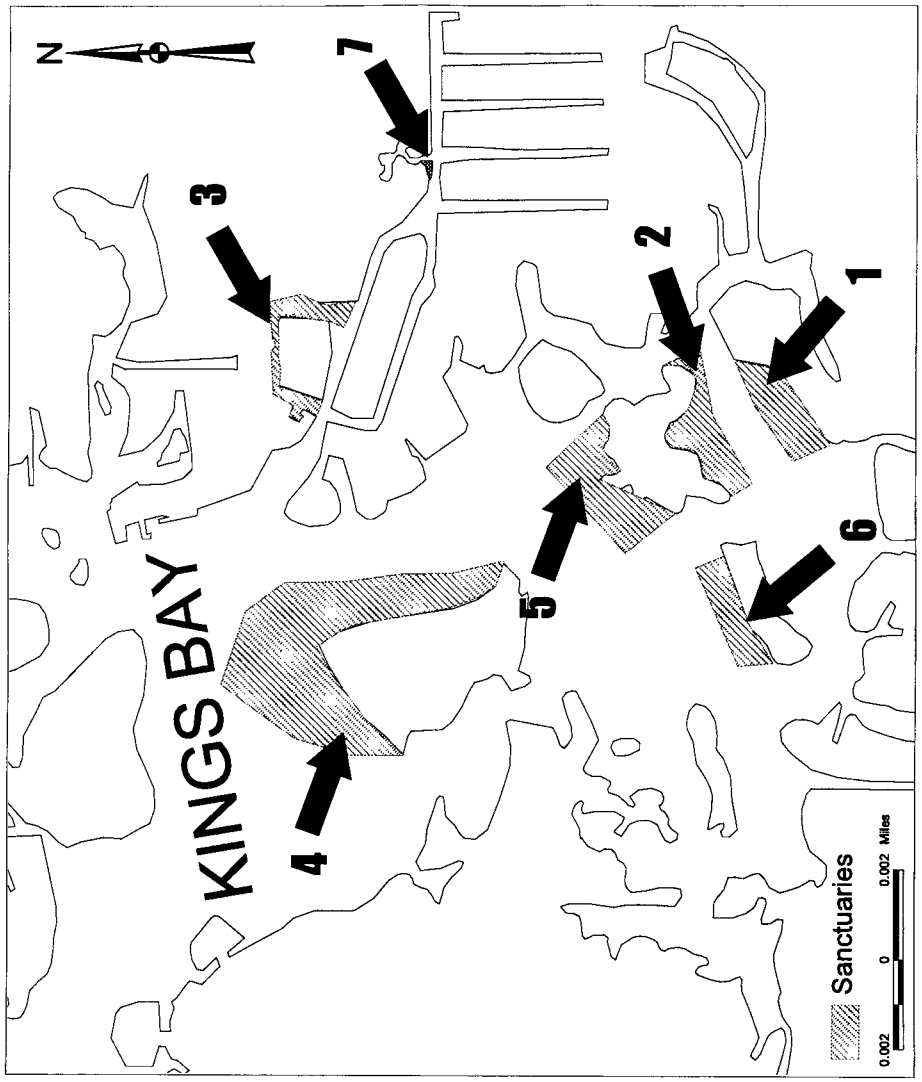
(5) A tract of submerged land, lying in Section 28, Township 18 South, Range 17 East in Citrus County, Florida, more particularly described as follows: For a point of reference, commence at the southwest corner of said Section 28; Then go N 28°55′06″ E for 2546.59 feet to a 4-inch diameter iron pipe marking the Point of Beginning; Then go N 44°23′41″ W for 282.45 feet to a 10-inch diameter concrete monument with an attached buoy; Then go N 33°53′16″ E for 764.07 feet to a 10-inch diameter concrete monument with an attached buoy; Then go S 31°51′55″ E for 333.22 feet to a 4-inch diameter iron pipe; Then continue S 31°51′55″ E for 5 feet more or less to the mean high water line of Banana Island; Then go westerly along said main high water line to a point lying S 44°23′41″ E from the point of beginning; Then go N 44°23′41″ W for 5 feet more or less to the point of beginning; Containing 4.6 acres, more or less, to be known as the Tarpon Springs Manatee Sanctuary.

(6) A tract of submerged land, lying in Section 28, Township 18 South, Range 17 East in Citrus County, Florida, more particularly described as follows: For a point of reference, commence at the southwest corner of said Section 28; Then go N 06°43′00″ E for 1477.54 feet to a 10-inch diameter concrete monument marking the Point of Beginning; Then

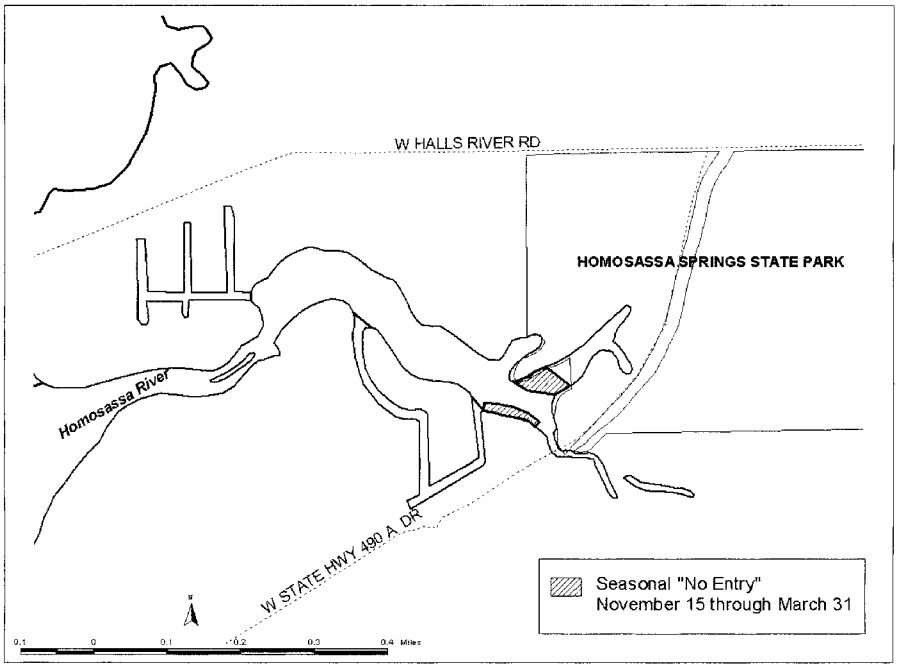
go N 06°24′59″ W for 251.66 feet to a 10-inch diameter concrete monument with an attached buoy; Then go N 65°41′12″ E for 637.83 feet to a 10-inch diameter concrete monument with an attached buoy; Then go S 55°40′52″ E for 272.86 feet to a 10-inch diameter concrete monument; Then continue S 65°15′06″ W for 857.22 feet to the point of beginning; Containing 4.0 acres, more or less, to be known as the Warden Key Manatee Sanctuary.

(7) A tract of submerged land, lying in Section 28, Township 18 South, Range 17 East, Tallahassee Meridian, Citrus County, Florida, more particularly described as follows: For a point of reference, commence at the southwest corner of said Section 28 (N–1651797.56 E–463846.96) Florida Coordinate System, West Zone, NAD 1983, N.G.S. adjustment of 1990 (expressed in U.S. survey feet); thence N. 40°08′47″ E., 5551.65 feet (5551.57 feet grid distance) to an aluminum monument stamped ''PSM 3341 1998'' (N1656009.01 E-467449.35) marking the Point of Beginning; thence N. 77°06′49″ E., 71.84 feet to an aluminum monument stamped ''PSM3341 1998'' (N–1656025.04, N–467519.38); thence S. 04°37′09″ W., 29.88 feet to an aluminum monument stamped ''PSM 3341 1998'' (N–1655995.26 E–467516.98); thence N. 78°29′57″ W., 69.01 feet to the point of beginning; to be known as the Three Sisters Spring Sanctuary.

NOTE: Map for paragraphs (a)(1) through (a)(7) follows:

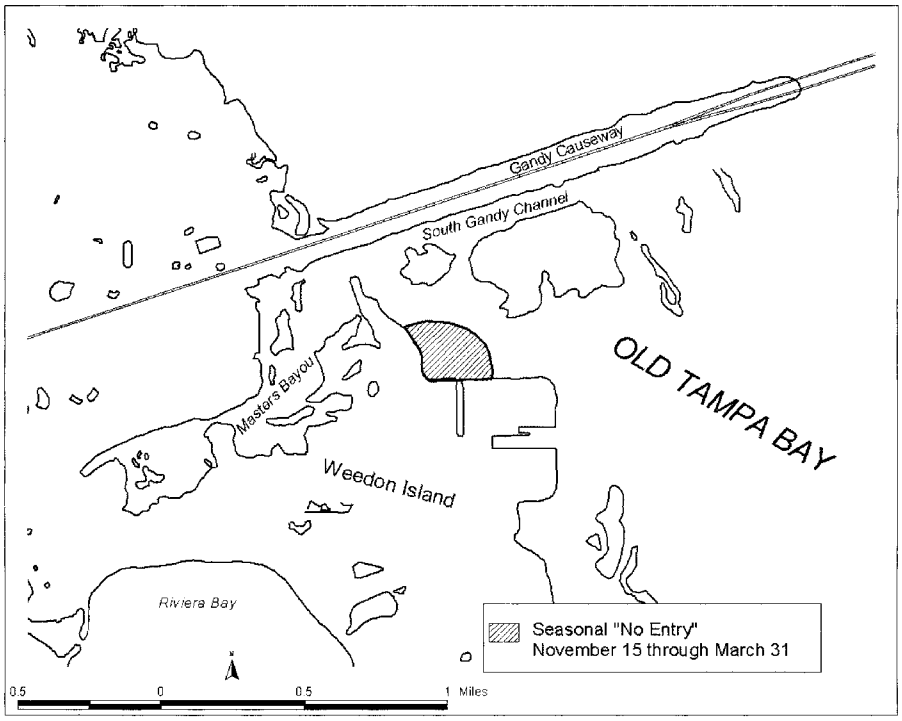


(8) That part of the Homosassa River, Homosassa, Citrus County, Florida, within Section 28, Township 19 South, Range 17 East, described as the headwaters of the Homosassa River (adjacent to the Homosassa Springs State Wildlife Park), including the spring run at the point where the run enters the northeast fork of the river along the southeastern shore and an area opposite this site along the southern shoreline; containing approximately 0.67 ha (1.66 acres). Map follows (see Blue Waters Manatee Sanctuary):



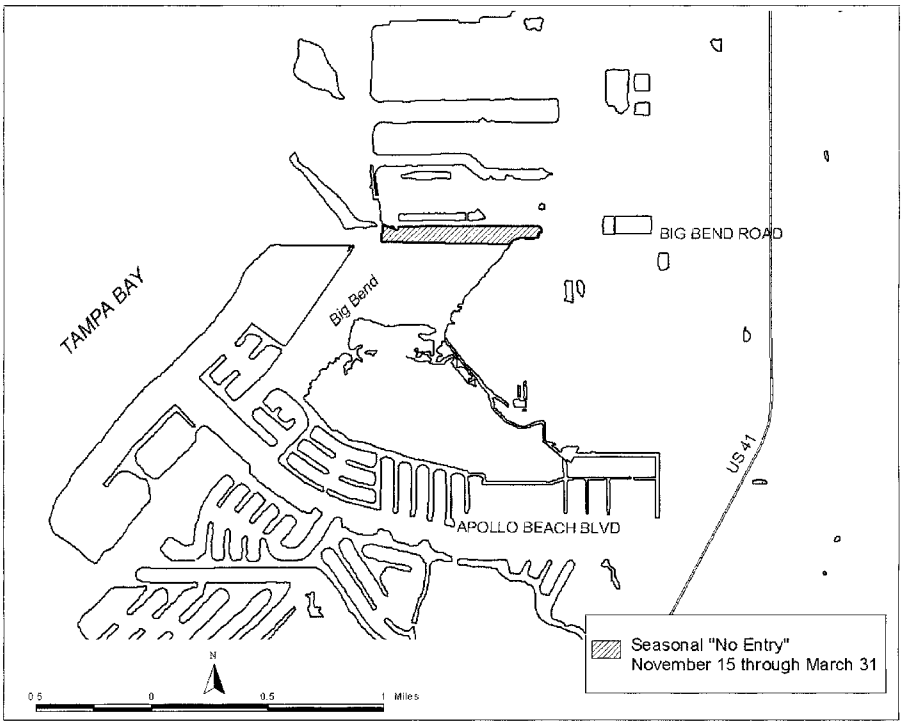
Blue Waters Manatee Sanctuary

(9) That part of Tampa Bay, St. Petersburg, Pinellas County, Florida, within Sections 16 and 21, Township 30 South, Range 17 East, described as the warm-water outflow of the Bartow Electric Generating Plant located on the northern shore of Weedon Island, encircling that point where the discharge enters receiving waters along the western shore of Old Tampa Bay; to be known as the Bartow Electric Generating Plant Manatee Sanctuary, containing approximately 12.07 ha (29.82 acres). Map follows (see Bartow Electric Generating Plant Manatee Sanctuary):



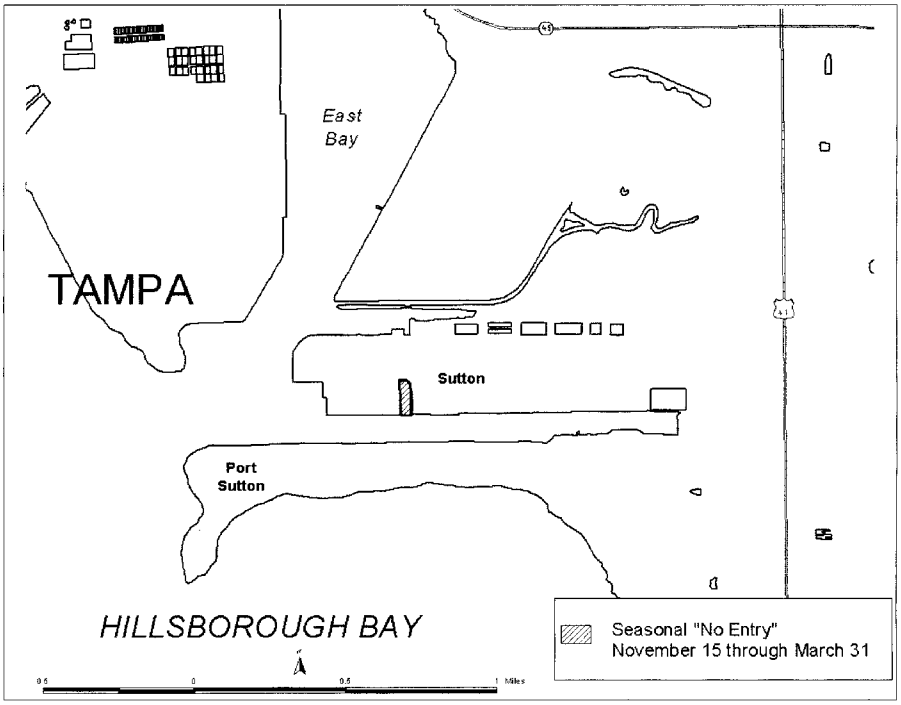
Bartow Electric Generating Plant Manatee Sanctuary

(10) That part of Tampa Bay, Tampa, Hillsborough County, Florida, within Sections 10 and 15, Township 31 South, Range 19 East, described as the waters in and around the warm-water outflow of the Tampa Electric Company Big Bend Electric Generating Station located west of Jackson Branch and including the Big Bend area of eastern Tampa Bay, to be known as the Tampa Electric Company Big Bend Manatee Sanctuary, containing approximately 12.08 ha (29.85 acres). Map follows (See TECO Big Bend Manatee Sanctuary):



TECO Big Bend Manatee Sanctuary

(11) That part of Tampa Bay, Tampa, Hillsborough County, Florida, lying within Section 4, Township 30 South, Range 19 East, described as the warm-water outflow of the Tampa Electric Company Gannon Electric Generating Station, to be known as the Port Sutton Manatee Sanctuary, containing approximately 1.1 ha (2.7 acres). Map follows (see Port Sutton Manatee Sanctuary):



Port Sutton Manatee Sanctuary

(b) *Exceptions.* (1) Adjoining property owners, their guests, employees, and their designees (including but not limited to contractors and lessees) may engage in watercraft access and property maintenance activities through manatee sanctuaries (set forth in paragraphs (a)(1) through (a)(11) of this section) and designated ''no-entry areas'' in the Kings Bay Manatee Refuge (set forth in paragraph (c)(14) of this section). Use of sanctuary and no-entry area waters is restricted to authorized individuals accessing adjoining properties, storing watercraft, and maintaining property and waterways. Maintenance activities include those actions necessary to maintain property and waterways, subject to any Federal, State, and local government permitting requirements.

(2) Authorized individuals must obtain a sticker or letter of authorization from the U.S. Fish and Wildlife Service identifying them as individuals authorized to enter no-entry areas that adjoin their property. Stickers must be placed in a conspicuous location to readily identify authorized watercraft. Individuals with a letter of authorization must have a valid letter in their possession when accessing no-entry areas.

(3) Authorized individuals must conduct any authorized boating activity within these areas at idle or no-wake speeds.

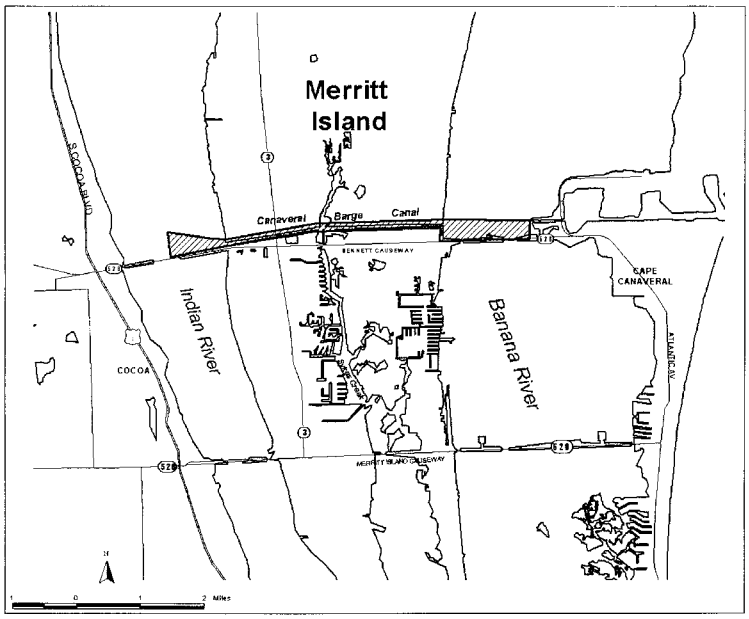
(c) *Manatee refuges.* The following areas are designated as manatee refuges. For each manatee refuge, we will state on appropriate signs which, if any, waterborne activities are prohibited, and state the applicable restrictions, if any, on permitted waterborne activities. The areas that will be posted are described as follows:

(1) *The Barge Canal Manatee Refuge.* (i) The Barge Canal Manatee Refuge is described as all waters lying within the

banks of the Barge Canal, Brevard County, Florida, including all waters lying within the marked channel in the Banana River that lie between the east entrance of the Barge Canal and the Canaveral Locks; containing approximately 276.3 ha (682.7 acres).

(ii) Watercraft are required to proceed at slow speed (channel included) all year. The use of watercraft at speeds greater than slow speed is prohibited throughout the Barge Canal Manatee Refuge.

(iii) Map of the Barge Canal Manatee Refuge follows:

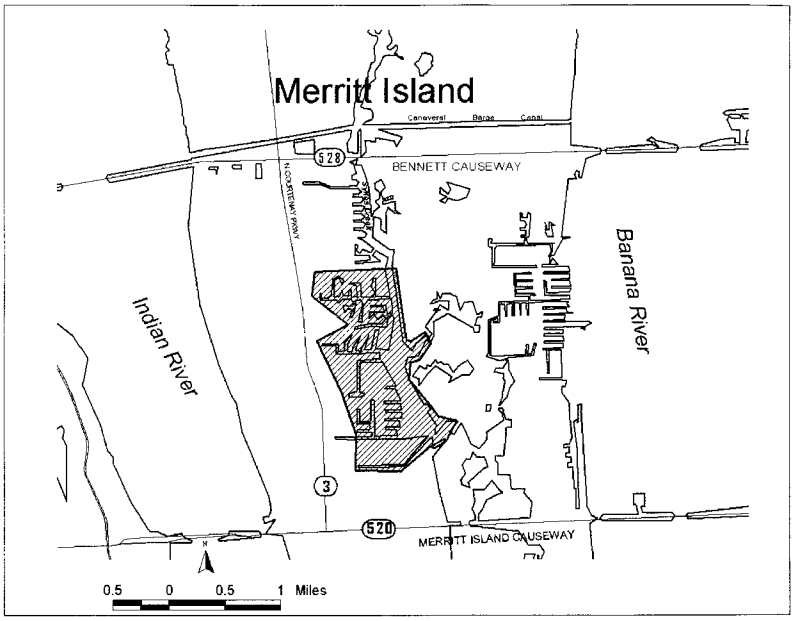


Barge Canal Manatee Refuge

(2) *The Sykes Creek Manatee Refuge.* (i) The Sykes Creek Manatee Refuge is described as all waters, including the marked channel in Sykes Creek, Brevard County, Florida. In particular, the portion of Sykes Creek southerly of the southern boundary of that portion of the creek commonly known as the ''S'' curve (said boundary being a line bearing east from a point on the western shoreline of Sykes Creek at approximate latitude 28 degrees 23′24″ N, approximate longitude 80 degrees 41′27″ W) and northerly of the Sykes Creek Parkway; containing approximately 342.3 ha (845.8 acres).

(ii) Watercraft are required to proceed at slow speed (channel included) all year. The use of watercraft at speeds greater than slow speed is prohibited throughout the Sykes Creek Manatee Refuge.

(iii) Map of the Sykes Creek Manatee Refuge follows:

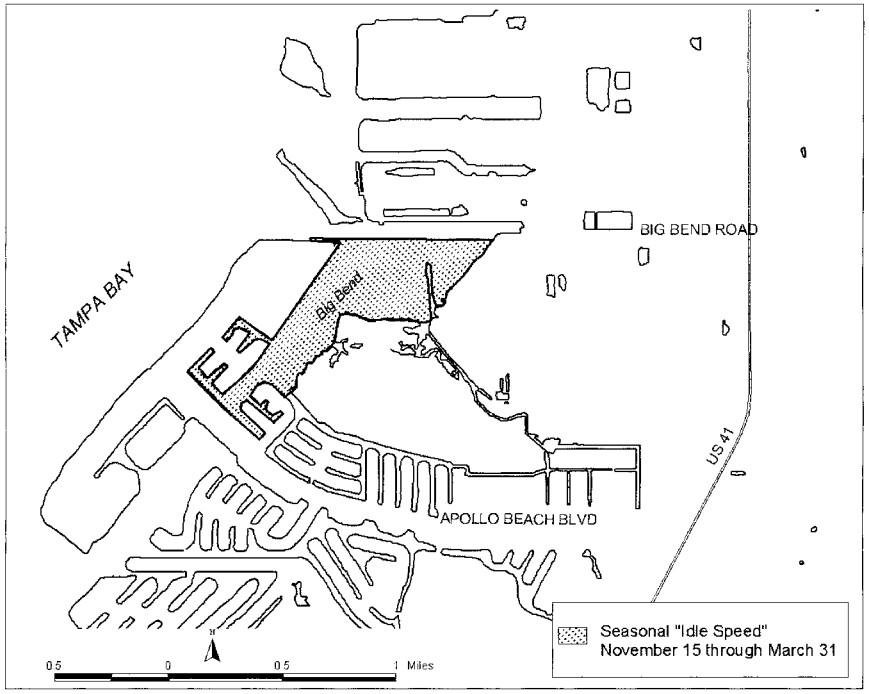


Sykes Creek Manatee Refuge

(3) *The Tampa Electric Company's Big Bend Manatee Refuge.* (i) The Tampa Electric Company's Big Bend Manatee Refuge is described as the entrance channel and those waters south of the manatee sanctuary at the Tampa Electric Company's Big Bend Electric Generating Station within Hillsborough County, Florida; containing approximately 89.35 ha (220.79 acres).

(ii) Watercraft are required to operate at idle speed from November 15 through March 31. Watercraft are prohibited from operating at speeds greater than idle speed from November 15 through March 31, inclusive.

(iii) Map of the Tampa Electric Company's Big Bend Manatee Refuge follows (see TECO Big Bend Manatee Refuge):

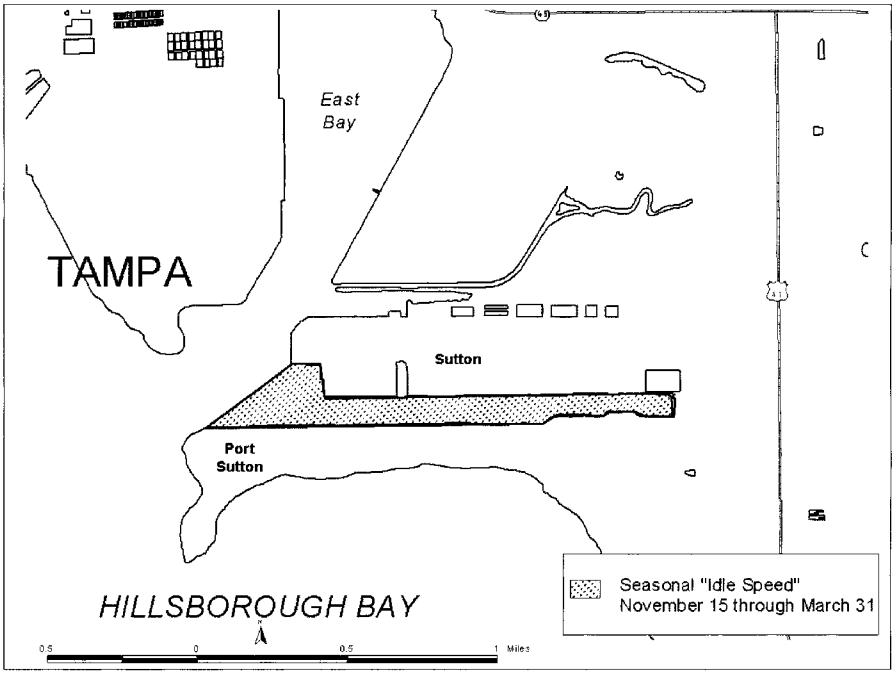


TECO Big Bend Manatee Refuge

(4) *The Port Sutton Manatee Refuge.* (i) The Port Sutton Manatee Refuge is described as those waters surrounding the Port Sutton Manatee Sanctuary, including all waters within Port Sutton, Hillsborough County, Florida; containing approximately 39.2 ha (96.9 acres).

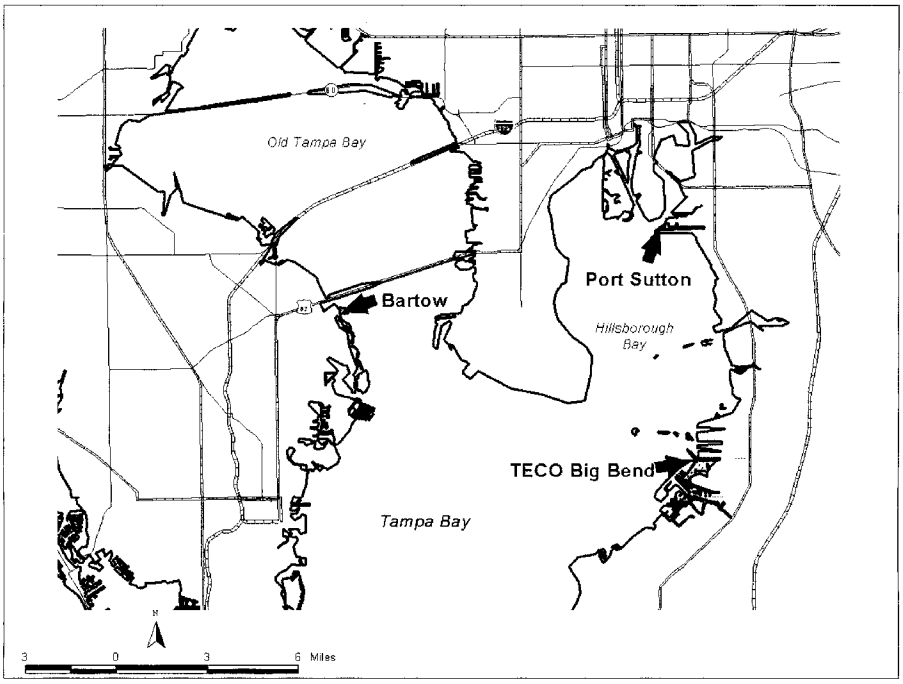
(ii) Watercraft are required to operate at idle speed from November 15 through March 31, inclusive. Watercraft are prohibited from operating at speeds greater than idle speed from November 15 through March 31, inclusive.

(iii) Map of Port Sutton Manatee Refuge follows (see Port Sutton Manatee Refuge):



Port Sutton Manatee Refuge

(iv) Map showing the relative locations of the Bartow, TECO Big Bend, and Port Sutton areas of Tampa Bay follows (see Tampa Bay Manatee Sanctuaries and Refuges):

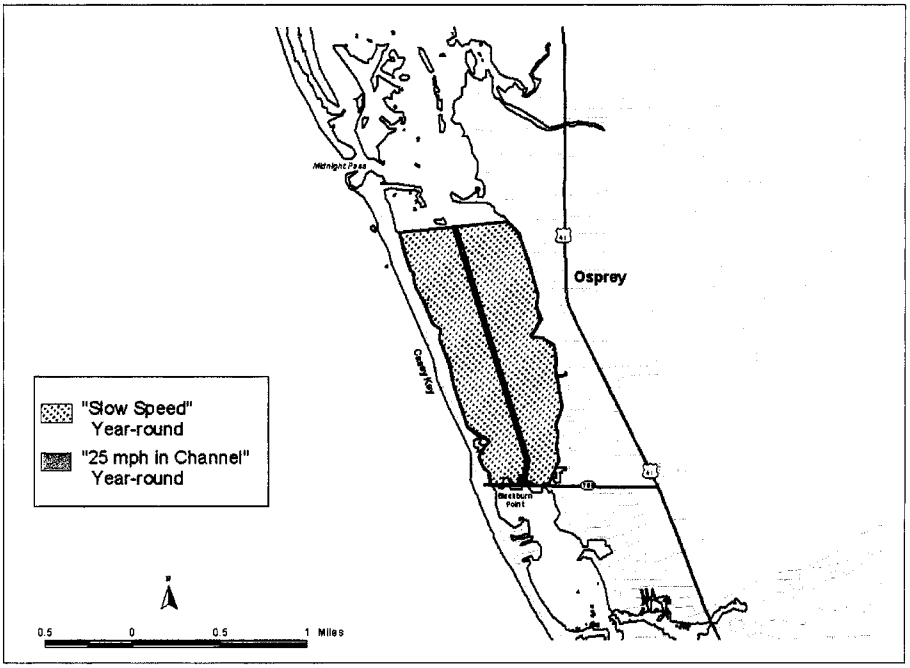


Tampa Bay Manatee Sanctuaries and Refuges

(5) *The Little Sarasota Bay Manatee Refuge.* (i) The Little Sarasota Bay Manatee Refuge is described as those waters lying southerly of a line that bears north 90 degrees 00′00″ E (true) and runs through the southerly tip of the first unnamed island south of Red Intracoastal Waterway Channel Marker ''40'' (latitude 27 degrees 10′07″ N, longitude 82 degrees 30′05″ W) and those waters lying northerly of the Blackburn Point Bridge, Sarasota County, Florida; containing approximately 214.2 ha (529.40 acres).

(ii) Watercraft are required to proceed at slow speed, 40 kilometers per hour (25 miles per hour) within the channel, year-round. Watercraft are prohibited from operating in excess of slow speed outside of the channel and operating at speeds in excess of 40 kilometers per hour (25 miles per hour) within the channel, year-round.

(iii) Map of the Little Sarasota Bay Manatee Refuge follows (see Little Sarasota Bay Manatee Refuge):

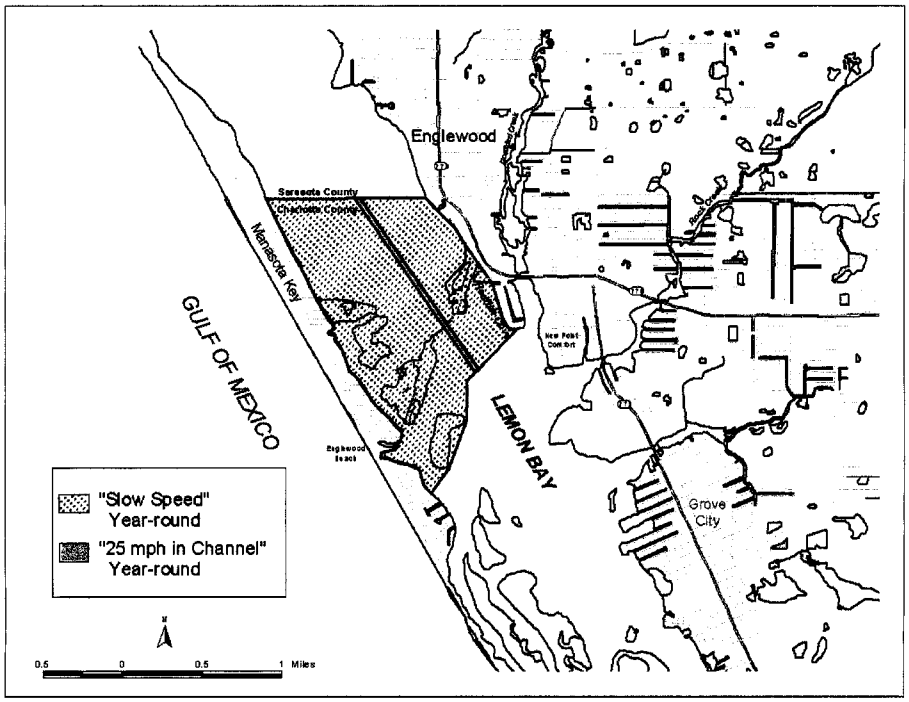


Little Sarasota Bay Manatee Refuge

(6) *The Lemon Bay Manatee Refuge.* (i) The Lemon Bay Manatee Refuge is described as those waters of Lemon Bay lying south of the Sarasota/Charlotte County, Florida, boundary and north of a line north 60 degrees 14′00″ E (true) parallel with a series of small islands approximately 1.6 kilometer (1 mile) south of the Bay Road Bridge; containing approximately 383.61 ha (948.06 acres).

(ii) Watercraft are required to proceed at slow speed, 40 kilometers per hour (25 miles per hour) within the channel, year-round. Watercraft are prohibited from operating in excess of slow speed outside of the channel and operating at speeds in excess of 40 kilometers per hour (25 miles per hour) within the channel, year-round.

(iii) Map of the Lemon Bay Manatee Refuge follows (see Lemon Bay Manatee Refuge):



Lemon Bay Manatee Refuge

(7) *The Peace River Manatee Refuge.* (i) The Peace River Manatee Refuge is described as all waters of the Peace River and certain associated water bodies north and east of the U.S. Highway 41, Charlotte and De Soto Counties, Florida; containing approximately 1.698.11 ha (4,196.11 acres).

(ii) In the Peace River in Charlotte County, watercraft are required to travel at slow speed within a posted shoreline buffer between the US Highway 41 and I–75 bridges. The buffer is approximately 300 meters (1,000 feet) from shore except in a slightly larger area north and west of I–75 to be consistent with recently adopted Florida Fish and Wildlife Conservation Commission's regulations. Watercraft are allowed to travel at a maximum speed of 40 kilometers per hour (25 miles per hour) year-round outside the buffer. Watercraft are prohibited from traveling in excess of slow speed within the posted shoreline buffer between the U.S. Highway 41 and I–75 bridges and are further prohibited from operating in excess of 40 kilometers per hour (25 miles per hour) outside the buffer throughout the year.

(iii) In the Peace River within Charlotte County and upstream of I–75 to red channel marker ''14,'' watercraft are required to travel at slow speed outside of the marked navigation channel. Watercraft are allowed to travel at a maximum speed of 40 kilometers per hour (25 miles per hour) year-round inside the marked navigation channel. Watercraft are prohibited from traveling in excess of slow speed in areas outside of the navigation channel and are further prohibited from traveling in excess of 40 kilometers per hour (25 miles per hour) inside the marked navigation channel, year-round.

(iv) In the waters of the Peace River in Charlotte and De Soto Counties upstream of red channel marker ''14,'' watercraft are allowed to travel at a

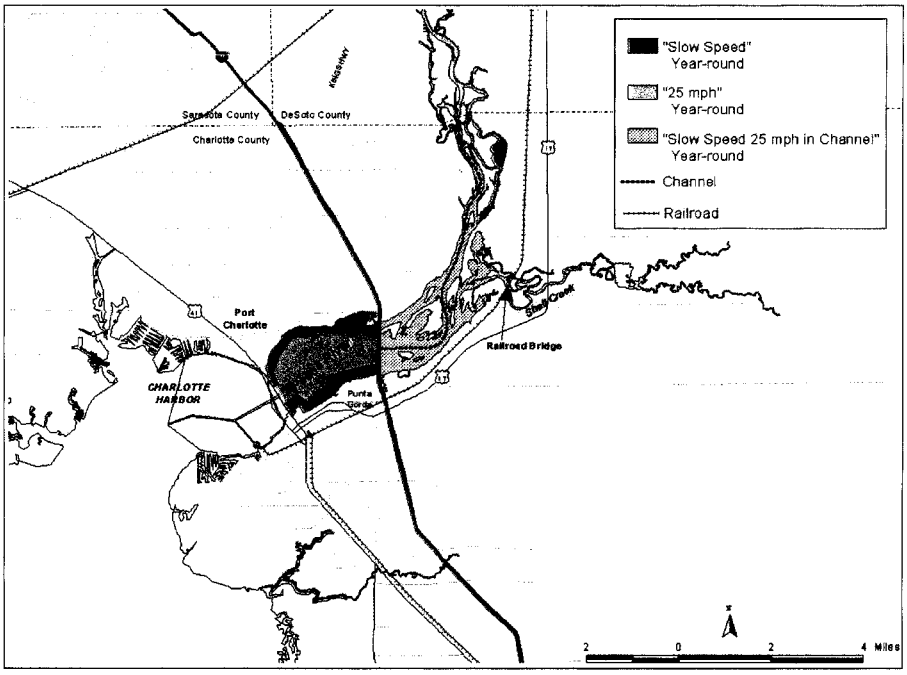
maximum speed of 40 kilometers per hour (25 miles per hour) year-round. Watercraft are prohibited from traveling in excess of 40 kilometers per hour (25 miles per hour), year-round, in this area.

(v) Within the waters of Jim Long Lake and Hunter Creek in Charlotte and De Soto Counties, watercraft are required to travel at slow speed year-round. Watercraft are prohibited from traveling in excess of slow speed in this area, year-round.

(vi) Within the waters of Deep Creek in Charlotte and De Soto Counties, watercraft are required to travel at slow speed year-round. Watercraft are prohibited from traveling in excess of slow speed in this area, year-round.

(vii) Within the waters of Shell Creek in Charlotte County, watercraft are required to travel at slow speed year-round with the following exception. Should a U.S. Coast Guard or State of Florida approved marked navigation channel be established in that portion of Shell Creek approximately 1.6 kilometers (1 mile) downstream of the Seaboard Railroad trestles, watercraft will be allowed to travel at a maximum speed of 40 kilometers per hour (25 miles per hour) in this section of Shell Creek upon posting by the Fish and Wildlife Service or the Florida Fish and Wildlife Conservation Commission. Watercraft are prohibited from traveling in excess of slow speed in this area, year-round.

(viii) Map of the Peace River Manatee Refuge follows (see Peace River Manatee Refuge):



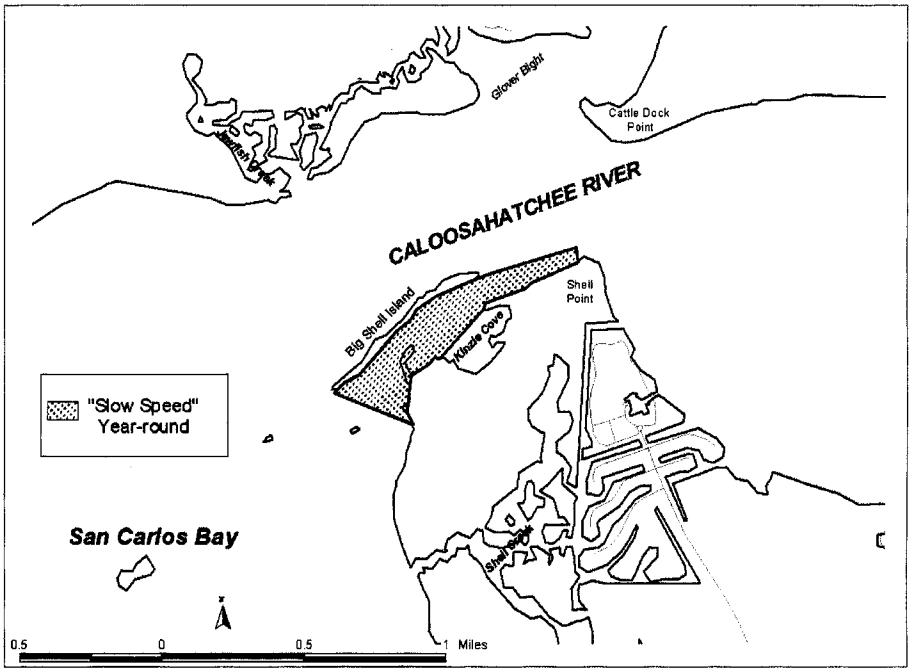
Peace River Manatee Refuge

(8) *The Shell Island Manatee Refuge.* (i) The Shell Island Manatee Refuge is described as all waters within the marked Intracoastal Waterway channel between Green Marker ''99'' (approximate

latitude 26 degrees 31′00″ N, approximate longitude 82 degrees 00′52″ W) and Green Marker ''93'' (approximate latitude 26 degrees 31′37″ N, approximate longitude 81 degrees 59′46″ W), Lee County, Florida; containing approximately 32.6 ha (80.5 acres).

(ii) Watercraft are required to proceed at slow speed (channel included) year-round. Watercraft are prohibited from traveling in excess of slow speed in this area, year-round.

(iii) Map of the Shell Island Manatee Refuge follows (see Shell Island Manatee Refuge):

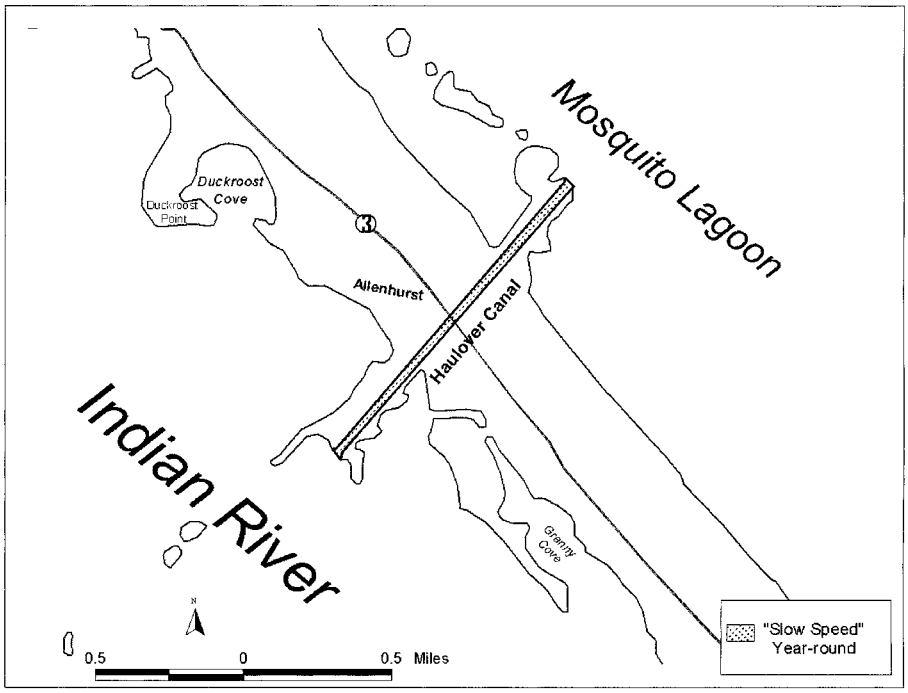


Shell Island Manatee Refuge

(9) *The Haulover Canal Manatee Refuge.* (i) The Haulover Canal Manatee Refuge is described as all waters lying within Haulover Canal in Brevard County, Florida; containing approximately 8.95 ha (22.11 acres).

(ii) Watercraft are required to proceed at slow speed (channel included) year-round. Watercraft are prohibited from traveling in excess of slow speed in this area, year-round.

(iii) Map of the Haulover Canal Manatee Refuge follows (see Haulover Canal Manatee Refuge):



Haulover Canal Manatee Refuge

(10) *The Caloosahatchee River—San Carlos Bay Manatee Refuge.*

(i) The Caloosahatchee River—San Carlos Bay Manatee Refuge is described as all waters of the Caloosahatchee River and San Carlos Bay downstream of the Seaboard Coastline trestle at Beautiful Island to Channel Marker ''93'' and from Channel Marker ''99'' to the Sanibel Causeway, in Lee County. A map showing the refuge and four maps showing specific areas in the refuge are at paragraph (10)(x) of this section.

(ii) From the Seaboard Coastline Railroad trestle at Beautiful Island, downstream to Channel Marker ''25'', a distance of approximately 1.6 kilometers (1 mile), watercraft are required to proceed at slow speed in the marked navigation channel from November 15 to March 31 and at not more than 40 kilometers per hour (km/h) (25 miles per hour) in the channel from April 1 to November 14. See map of ''Edison Bridge Area'' in paragraph (10)(x) of this section.

(iii) From a point 152 meters (500 feet) east of the Edison Bridge downstream to a point 152 meters (500 feet) west of the Caloosahatchee Bridge, approximately 1.1 kilometers (0.7 mile) in length, shoreline-to-shoreline (including the marked navigation channel), watercraft are required to proceed at slow speed (channel included), year-round. See map of ''Edison Bridge Area'' in paragraph (10)(x) of this section.

(iv) From a point 152 meters (500 feet) west of the Caloosahatchee Bridge downstream to a point 152 meters (500 feet) northeast of the Cape Coral Bridge, a distance of approximately 10.9 kilometers (6.8 miles), watercraft are required to proceed year-round at slow speed, while traveling within shoreline buffers extending out from the shore to a minimum distance of approximately 402 meters (1,320 feet), as

marked. Watercraft, with the exception of seaplanes, are required to proceed at not more than 40 km/h (25 miles per hour) throughout the year between these buffers (including the marked navigation channel where not more restrictively designated). See map of ''Cape Coral Bridge Area'' in paragraph (10)(x) of this section.

(v) From a point 152 meters (500 feet) northeast of the Cape Coral Bridge downstream to a point 152 meters (500 feet) southwest of the Cape Coral Bridge, a distance of approximately 0.4 kilometer (0.25 mile), shoreline-to-shoreline (excluding the marked navigation channel), watercraft are required to proceed at slow speed, year-round. In the marked navigation channel, watercraft are required to proceed at not more than 40 km/h (25 miles per hour) throughout the year. See map of ''Cape Coral Bridge Area'' in paragraph (10)(x) of this section.

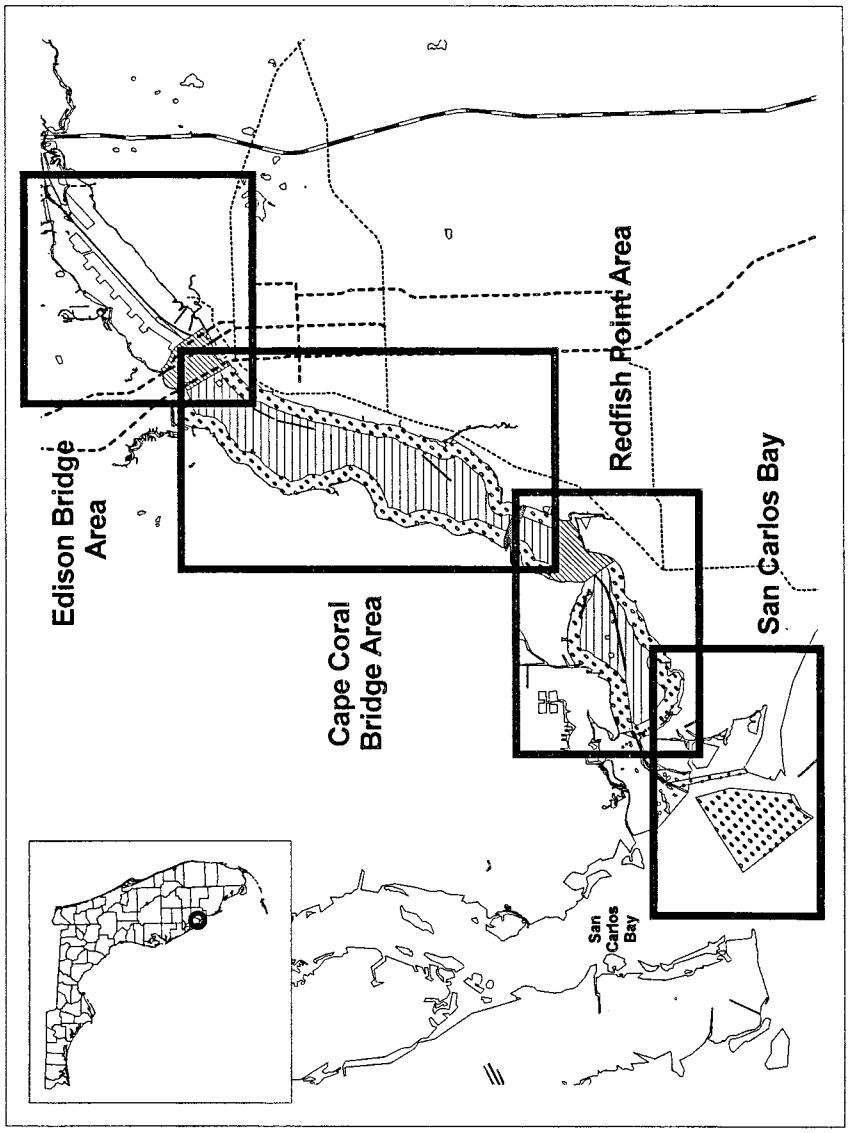
(vi) From a point 152 meters (500 feet) southwest of the Cape Coral Bridge to Channel Marker ''72,'' a distance of approximately 1.9 kilometers (1.2 miles), watercraft are required to proceed year-round at slow speed, while traveling within shoreline buffers extending out from the shore to a minimum distance of approximately 402 meters (1,320 feet), as marked. Watercraft are required to proceed at not more than 40 km/h (25 miles per hour) throughout the year between these buffers (including the marked navigation channel where not more restrictively designated). See map of ''Redfish Point Area'' in paragraph (10)(x) of this section.

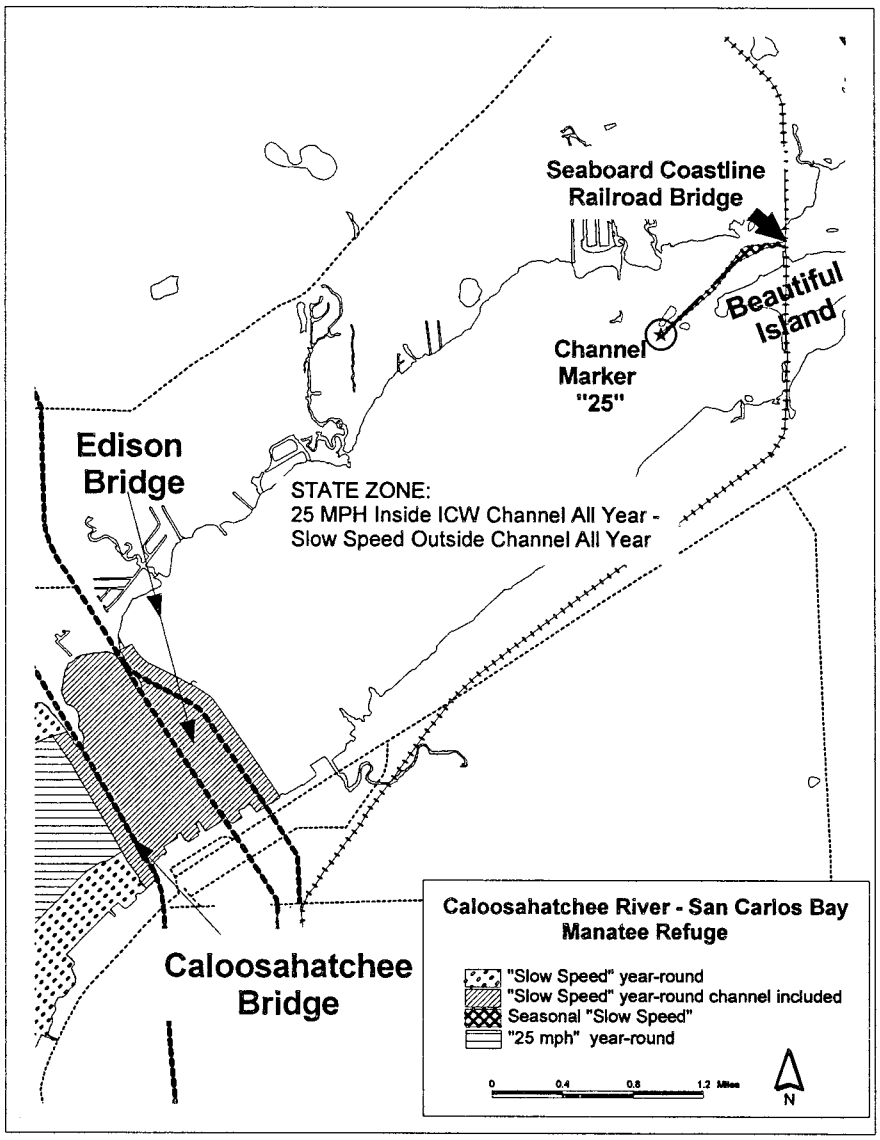
(vii) From Channel Marker ''72'' to Channel Marker ''76'' (in the vicinity of Redfish Point), for a distance of approximately 1.8 kilometers (1.1 miles) in length, shoreline-to-shoreline (including the marked navigation channel), watercraft are required to proceed at slow speed, year-round. See map of ''Redfish Point Area'' in paragraph (10)(x) of this section.

(viii) From Channel Marker ''76'' to Channel Marker ''93,'' a distance of approximately 5.2 kilometers (3.2 miles) in length, watercraft are required to proceed year-round at slow speed, while traveling within shoreline buffers extending out from the shore to a minimum distance of approximately 402 meters (1,320 feet), as marked. Watercraft are required to proceed at not more than 40 km/h (25 miles per hour) throughout the year between these buffers (including the marked navigation channel where not more restrictively designated). See map of ''Redfish Point Area'' in paragraph (10)(x) of this section.

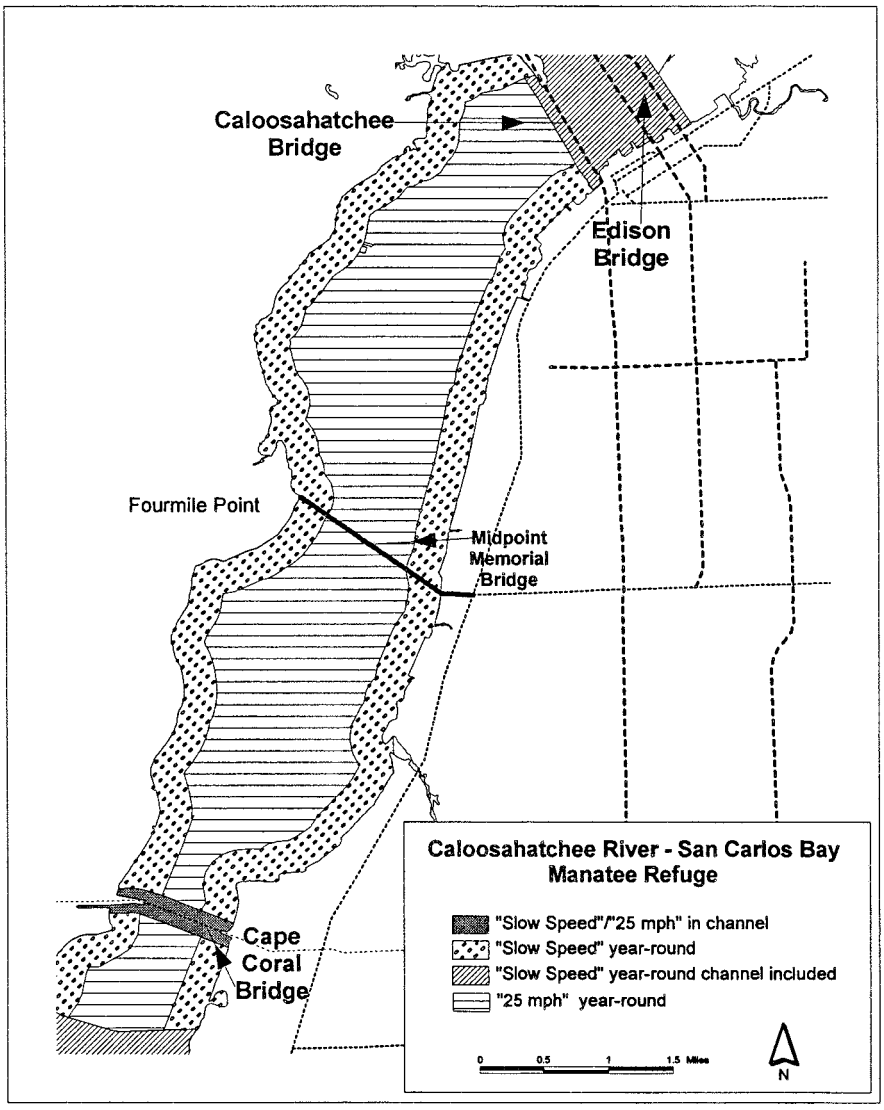
(ix) Except as described below and as marked, from Channel Marker ''99'' to the Sanibel Causeway, watercraft are required to proceed at slow speed year-round in San Carlos Bay within the following limits: A northern boundary described by the southern edge of the marked navigation channel, a line approximately 2.9 kilometers (1.8 miles) in length; a southern boundary described by the Sanibel Causeway (approximately 1.9 kilometers (1.2 miles) in length); a western boundary described by a line that connects the western end of the easternmost Sanibel Causeway island and extending northwest to Channel Marker ''7'' (approximately 2.9 kilometers (1.8 miles) in length); and the eastern boundary includes the western limit of the State-designated manatee protection area (68C–22.005) near Punta Rassa (approximately 2.9 kilometers (1.8 miles) in length). However this area excludes the marked navigation channel from Channel Marker ''99'' to the Sanibel Causeway and adjacent waters, as marked. See map of ''San Carlos Bay'' in paragraph (10)(x) of this section.

(x) Five maps of the Caloosahatchee River—San Carlos Bay Manatee Refuge follow:

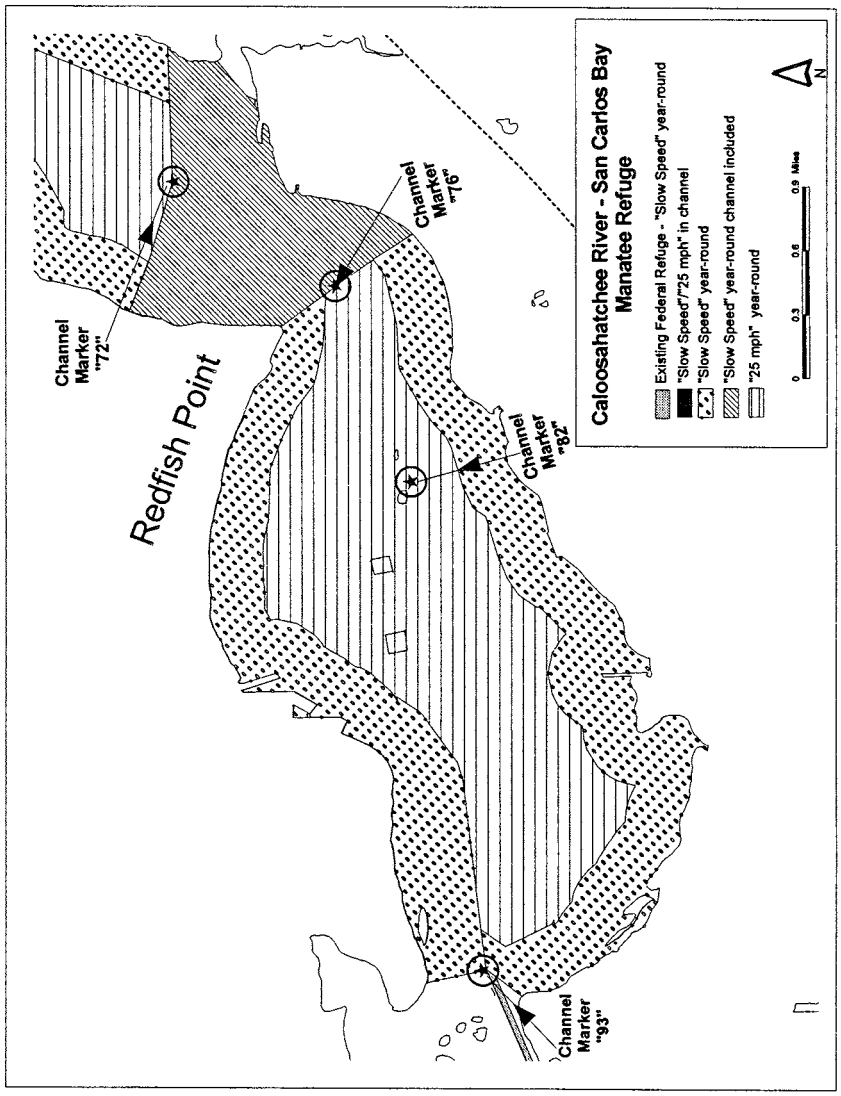

Edison Bridge Area
Cape Coral Bridge Area
Redfish Point Area
San Carlos Bay
San Carlos Bay
Caloosahatchee River - San Carlos Bay Manatee Refuge



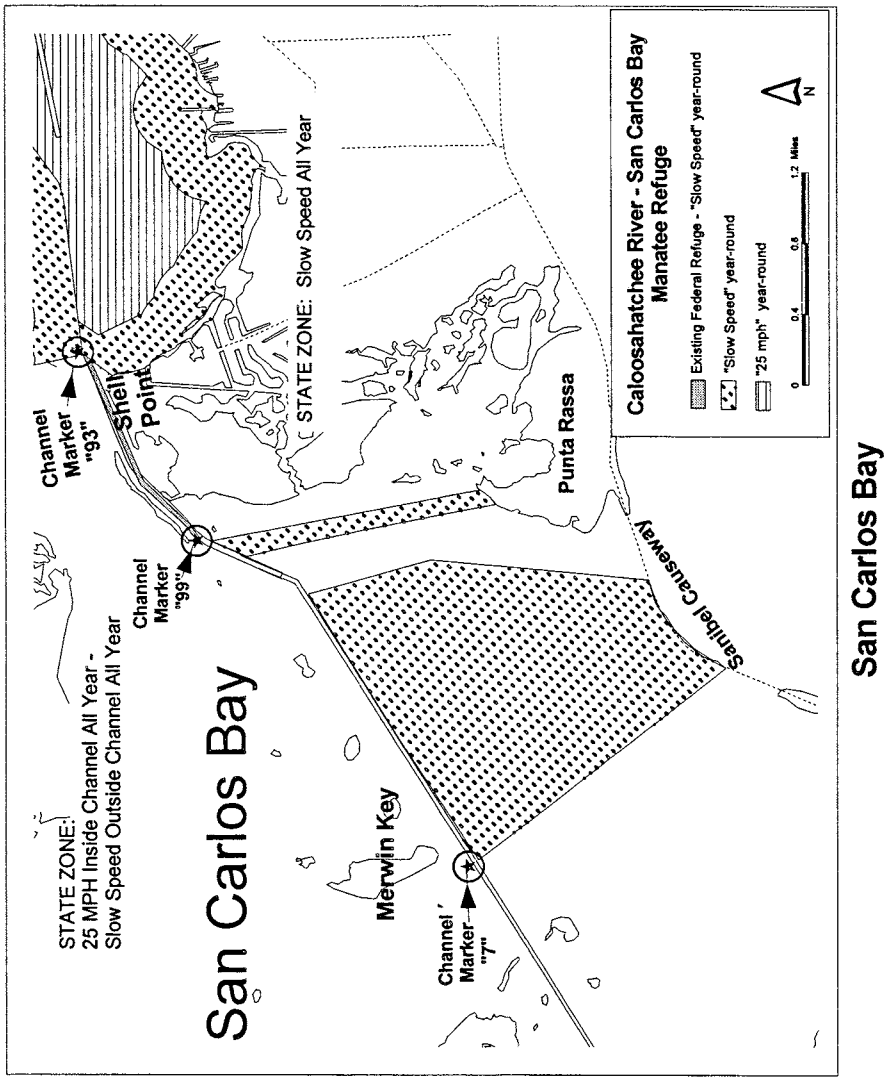
Edison Bridge Area



Cape Coral Bridge Area



Redfish Point Area



(11) *The Lower St. Johns River Manatee Refuge.*

(i) The Lower St. Johns River Manatee Refuge is described as portions of the St. Johns River and adjacent waters in Duval, Clay, and St. Johns Counties from Sandfly Point (the intersection of the right descending bank of the Trout River and the left descending bank of the St. Johns River) and Reddie Point, as marked, upstream to the mouth of Peter's Branch, including Doctors Lake, in Clay County on the western shore, and to the southern shore of the mouth of Julington Creek in St. Johns County on the eastern shore. A map showing the refuge and two maps showing specific areas of the refuge are at paragraph (11)(vi) of this section.

(ii) In the St. Johns River from Sandfly Point on the left descending

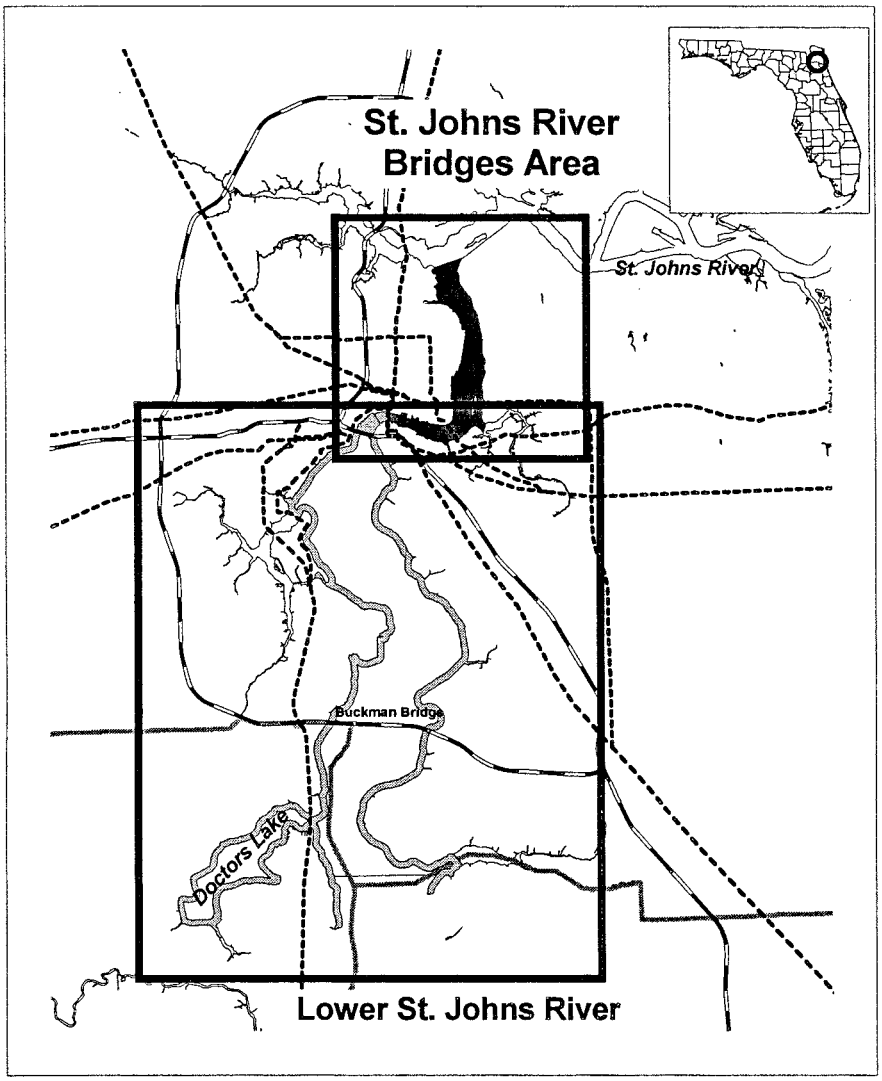
bank of the St. Johns River and Reddie Point on the right descending bank of the St. Johns River, upstream to the Hart Bridge, a distance of approximately 5.5 miles (8.8 km), watercraft are required to proceed at slow speed, year-round, within 300 feet (91 m) of the shoreline on the left descending bank of the St. Johns River and within a buffer as marked, typically about 1,000 feet (305 m) from the shoreline along the right descending bank of the river. The slow speed designation also includes that portion of the river between Exchange Island and the right descending bank, a marked buffer approximately 300 feet (91 m) along the west (channel-ward) shoreline of Exchange Island, and a portion of the Arlington River as marked. Watercraft are also required to proceed at not more than 25 miles per hour (40 km/h), year round, in the area posted as such between these slow speed shoreline buffers. See map of ''St. Johns River Bridges Area'' in paragraph (11)(vi) of this section.

(iii) From the Hart Bridge to the Main Street Bridge, a distance of approximately 2 miles (3.2 km), watercraft are required to proceed at slow speed, year-round, outside the marked navigation channel and at speeds of not more than 25 miles per hour (40 km/h) in the marked channel (from Channel Marker ''81'' to the Main Street Bridge, the channel is defined as the line of sight extending west from Channel Markers ''81'' and ''82'' to the fenders of the Main Street Bridge). See map of ''St. Johns River Bridges Area'' in paragraph (11)(vi) of this section.

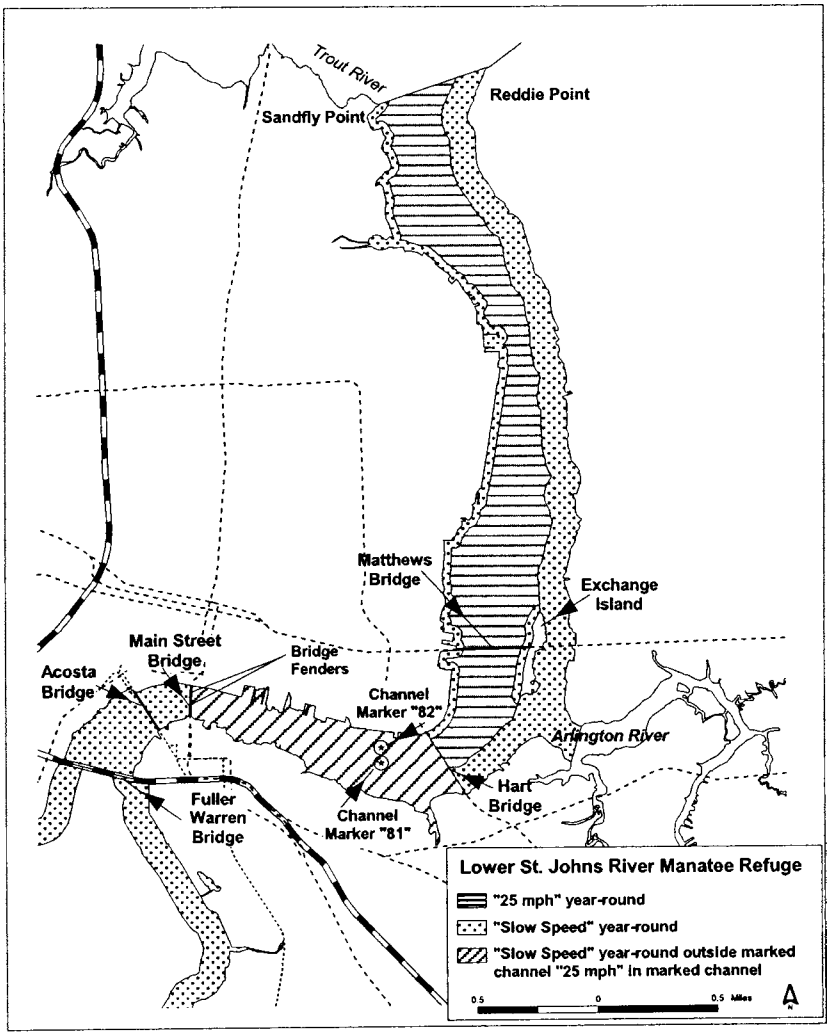
(iv) From the Main Street Bridge to the Fuller Warren Bridge, a distance of approximately 1 mile (1.6 km), shoreline to shoreline, watercraft are required to proceed at slow speed (channel included), year-round. See map of ''St. Johns River Bridges Area'' in paragraph (11)(vi) of this section.

(v) Upstream of the Fuller Warren Bridge: for a distance of approximately 19.3 miles (31.1 km) along the left descending bank of the St. Johns River, watercraft are required to proceed at slow speed, year-round, in a 700-foot (213 m) to 1,000-foot (305 m) as-marked, shoreline buffer from the Fuller Warren Bridge to the south bank of the mouth of Peter's Branch in Clay County; for a distance of approximately 20.2 miles (32.5 km) along the right descending bank of the St. Johns River, watercraft are required to proceed at slow speed, year round, in a 700-foot (213 m) to 1,000-foot (305 m) as marked, shoreline buffer from the Fuller Warren Bridge to the south bank of the mouth of Julington Creek in St. Johns County (defined as a line north of a western extension of the Nature's Hammock Road North); and in Doctors Lake in Clay County watercraft are required to proceed at slow speed, year-round, in a 700-foot (213 m) to 900-foot (274 m) as-marked, shoreline buffer (approximately 12.9 miles (20.8 km)). See map of ''Lower St. Johns River'' in paragraph (11)(vi) of this section.

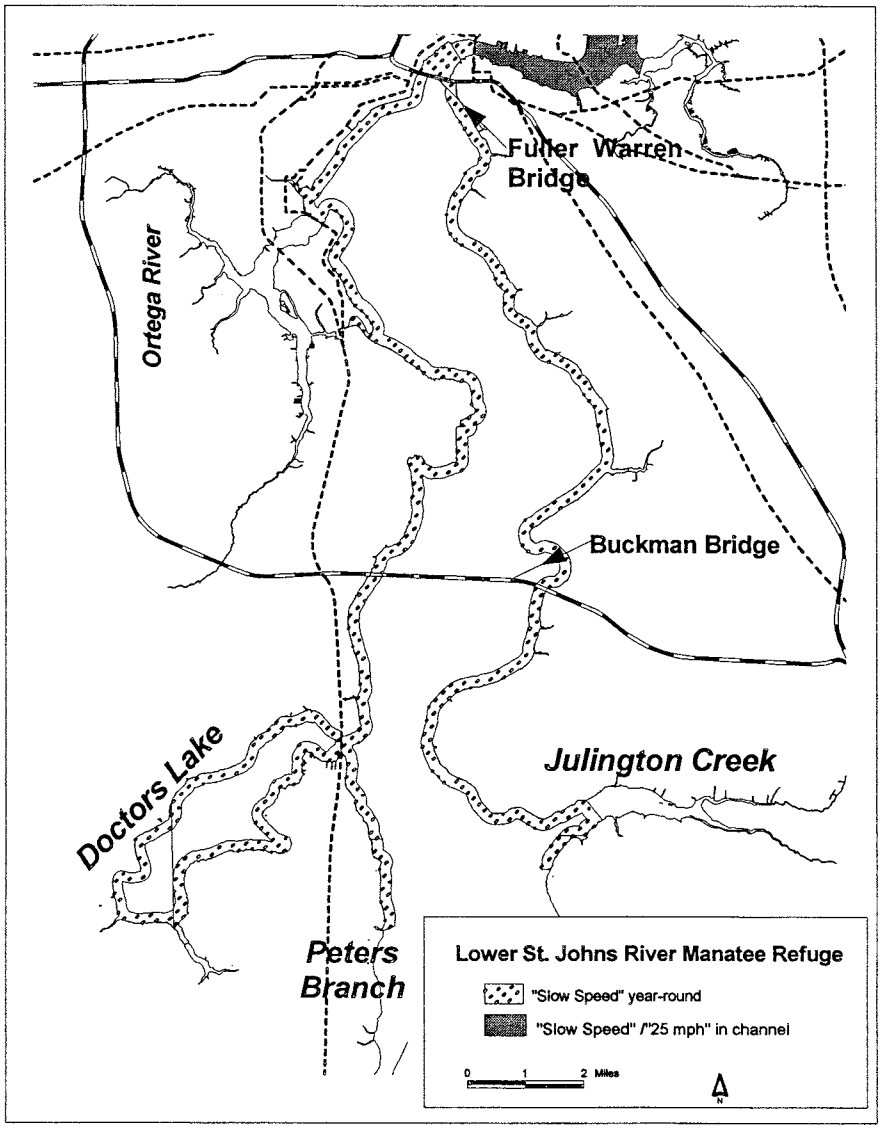
(vi) Three maps of the Lower St. Johns River Manatee Refuge follow:



Lower St. Johns River Manatee Refuge



St. Johns River Bridges Area



Lower St. Johns River

(12) *The Halifax and Tomoka Rivers Manatee Refuge.*

(i) The Halifax and Tomoka Rivers Manatee Refuge is described as the Halifax River and associated waterbodies in Volusia County, from the Volusia County—Flagler County line to New Smyrna Beach. A map showing the refuge and eight maps showing specific areas in the refuge are at paragraph (12)(xii) of this section.

(ii) From the Volusia County—Flagler County line at Halifax Creek

south to Channel Marker ''9,'' a distance of approximately 11.3 kilometers (7.0 miles) in length, watercraft are required to proceed at not more than 40 km/h (km/h)(25 miles per hour) in the channel. See maps of ''Halifax Creek'' and ''Tomoka River Basin'' in paragraph (12)(xii) of this section.

(iii) From Channel Marker ''9'' to a point 152 meters (500 feet) north of the Granada Bridge (State Road 40) (including the Tomoka Basin), a distance of approximately 5.0 km (3.1 miles) in length, watercraft are required to proceed at not more than 40 km/h (25 mph) in areas between the existing 91-meter (300-foot) buffers (and including the marked navigation channel). See maps of ''Tomoka River Basin'' and ''Tomoka River'' in paragraph (12)(xii) of this section.

(iv) In the Tomoka River, from the I–95 Bridge to Alligator Island, as marked, a distance of approximately 1.6 kilometers (1 mile), watercraft are required to proceed at slow speed, shoreline to shoreline, from April 1 to August 31. See map of ''Tomoka River'' in paragraph (12)(xii) of this section.

(v) From 152 meters (500 feet) north to 305 meters (1,000 feet) south of the Granada Bridge (State Road 40), a distance of approximately 0.5 kilometers (0.3 miles) in length, watercraft are required to proceed at slow speed, year-round, shoreline to shoreline. See map of ''Halifax River A'' in paragraph (12)(xii) of this section.

(vi) From a point 305 meters (1,000 feet) south of the Granada Bridge (State Road 40) to a point 152 meters (500 feet) north of the Seabreeze Bridge, a distance of approximately 6.4 km (4.0 miles) in length, watercraft are required to proceed at not more than 40 km/h (25 mph) in areas between the existing 91-meter (300-foot) buffers (and including the marked navigation channel). See map of ''Halifax River A'' in paragraph (12)(xii) of this section.

(vii) As marked, from 152 meters (500 feet) north of the Seabreeze Bridge, to 152 meters (500 feet) north of the Main Street bridge, a distance of approximately 1 kilometer (1 mile) in length, watercraft are required to proceed at slow speed (channel included), year-round. See map of ''Halifax River B'' in paragraph (12)(xii) of this section.

(viii) From Channel Marker ''40'' to a point a minimum of 152 meters (500 feet) north, as marked, of the Dunlawton Bridge, a distance of approximately 14.5 kilometers (9 miles) in length, watercraft are required to proceed at not more than 40 km/h (25 mph) in areas between the existing 91-meter (300-foot) buffers (and including the marked navigation channel). See map of ''Halifax River B'' in paragraph (12)(xii) of this section.

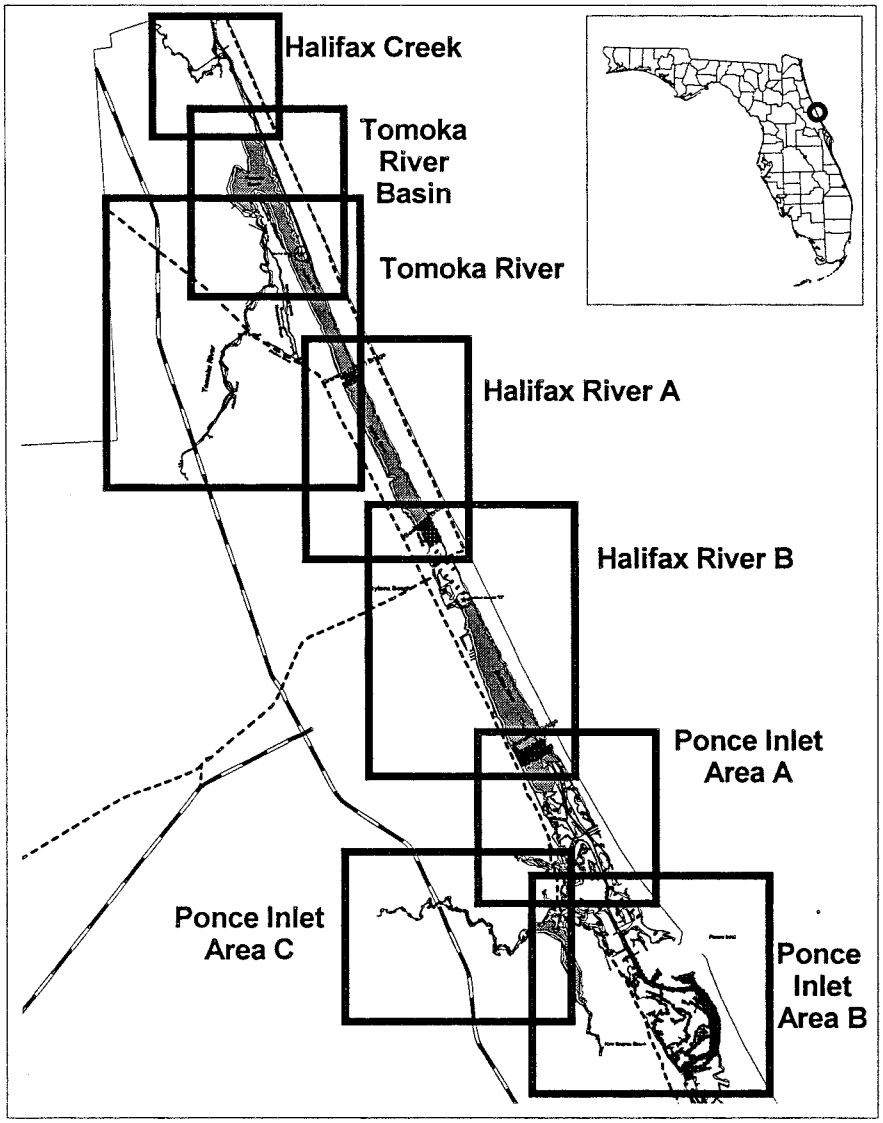
(ix) As marked, a minimum of 152 meters (500 feet) north to 152 meters (500 feet) south of the Dunlawton Bridge, a distance of approximately 0.3 kilometers (0.2 miles) in length, watercraft are required to proceed at slow speed (channel included), year-round, shoreline to shoreline; and adjacent to the western shoreline of the Halifax River north of the Dunlawton Bridge for a distance of approximately 640 meters (2,100 feet), and a minimum of 91 meters (300 feet) from shore, as marked, watercraft are required to proceed at slow speed, year-round. See map of ''Halifax River B'' in paragraph (12)(xii) of this section.

(x) As marked, from a minimum of 152 meters (500 feet) south of the Dunlawton Bridge to Redland Canal, a distance of approximately 10.5 kilometers (6.5 miles) in length, watercraft are required to proceed at not more than 40 km/h (25 mph) in waters not more restrictively designated; along the western shore of the Halifax River, a distance of approximately 3.1 km (1.95 miles), watercraft are required to proceed at not more than 40 km/h (25 mph) in the waters not more restrictively designated; in Rose Bay, a distance of approximately 2.7 km (1.7 miles), watercraft are required to proceed at not more than 40 km/h (25 mph) in waters not more restrictively designated; in Turnbull Bay, a distance of approximately 3.9 km (2.4 miles), watercraft are required to proceed at not more than 40 km/h (25 mph) in waters not more restrictively designated. See maps of ''Ponce Inlet Area A,'' ''Ponce Inlet Area B,'' and ''Ponce Inlet Area C'' in paragraph (12)(xii) of this section.

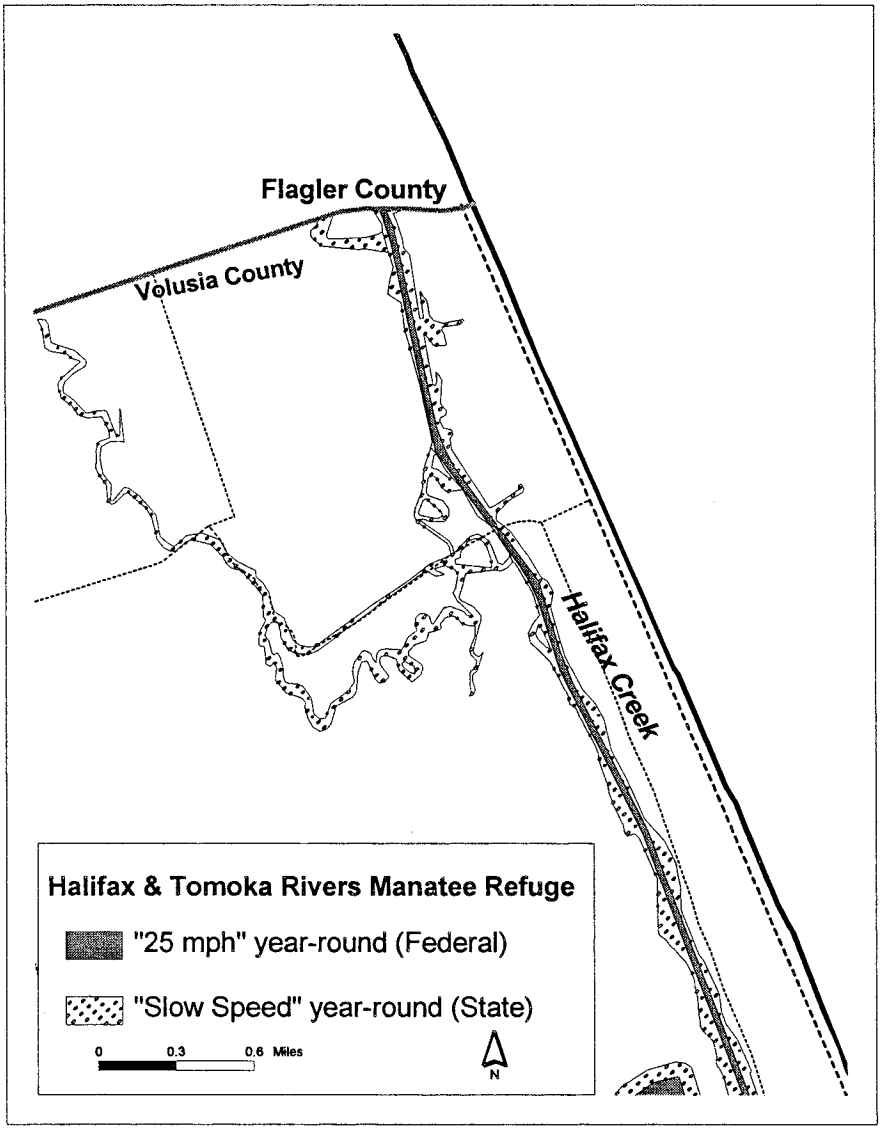
(xi) As marked, in the Intracoastal Waterway and adjacent waters from Redland Canal to the A1A Bridge (New

Smyrna Beach, for a distance of approximately 5.3 kilometers (3.3 miles) in length, watercraft are required to proceed at slow speed (channel included), year-round. See map of ''Ponce Inlet Area B'' in paragraph (12)(xii) of this section.

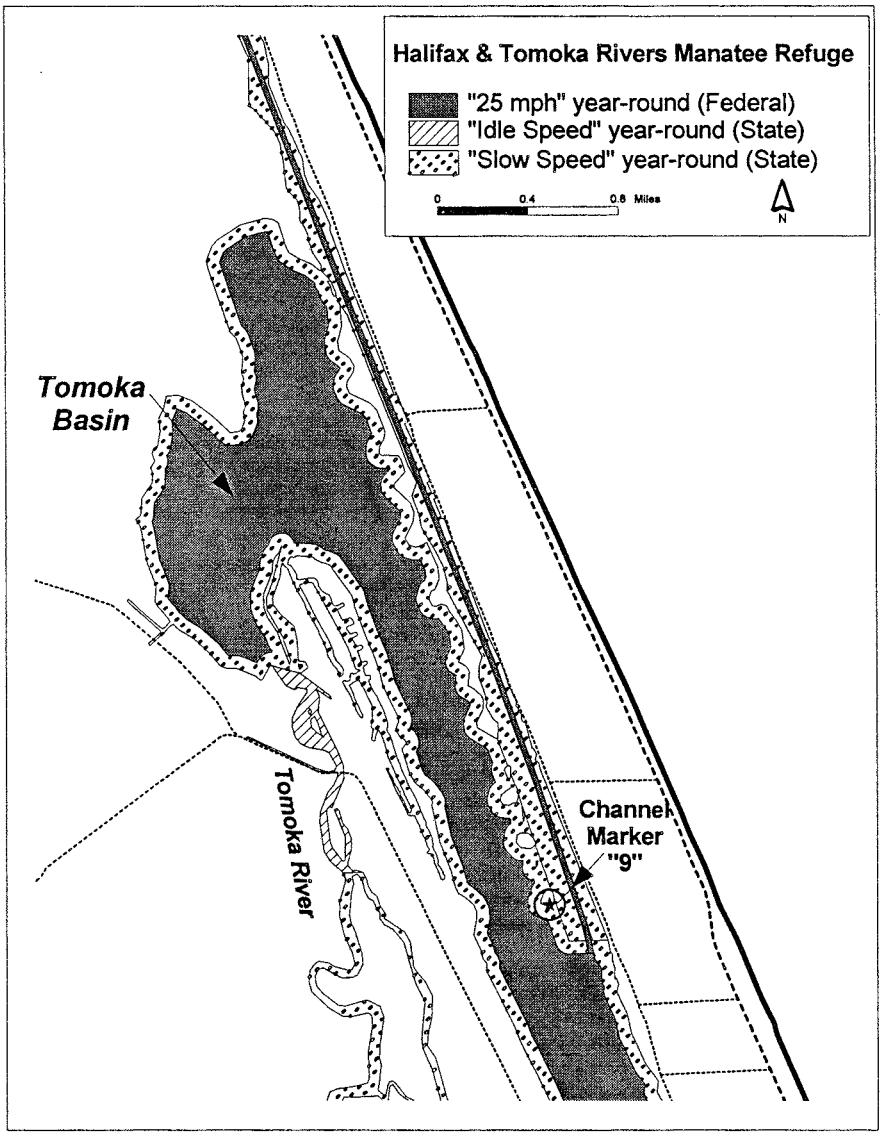
(xii) Nine maps of the Halifax and Tomoka Rivers Manatee Refuge follow:



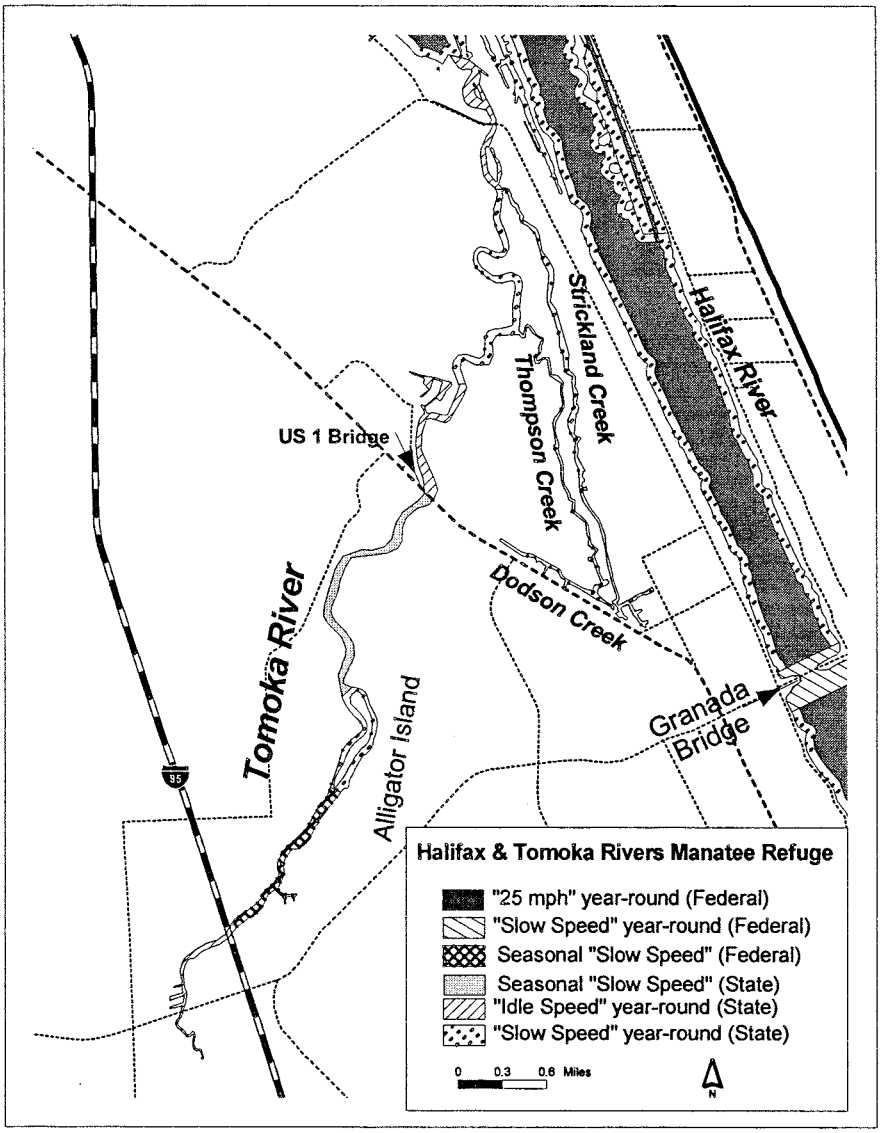
Halifax & Tomoka Rivers Manatee Refuge



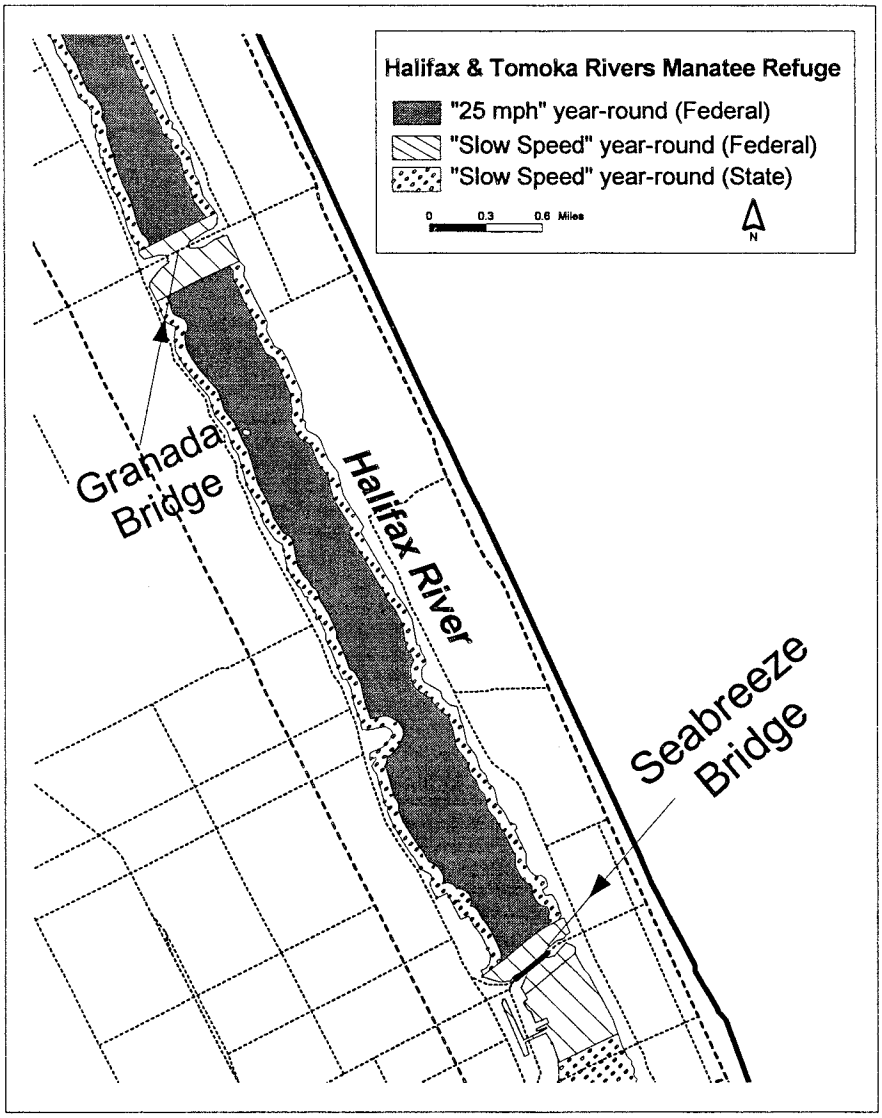
Halifax Creek



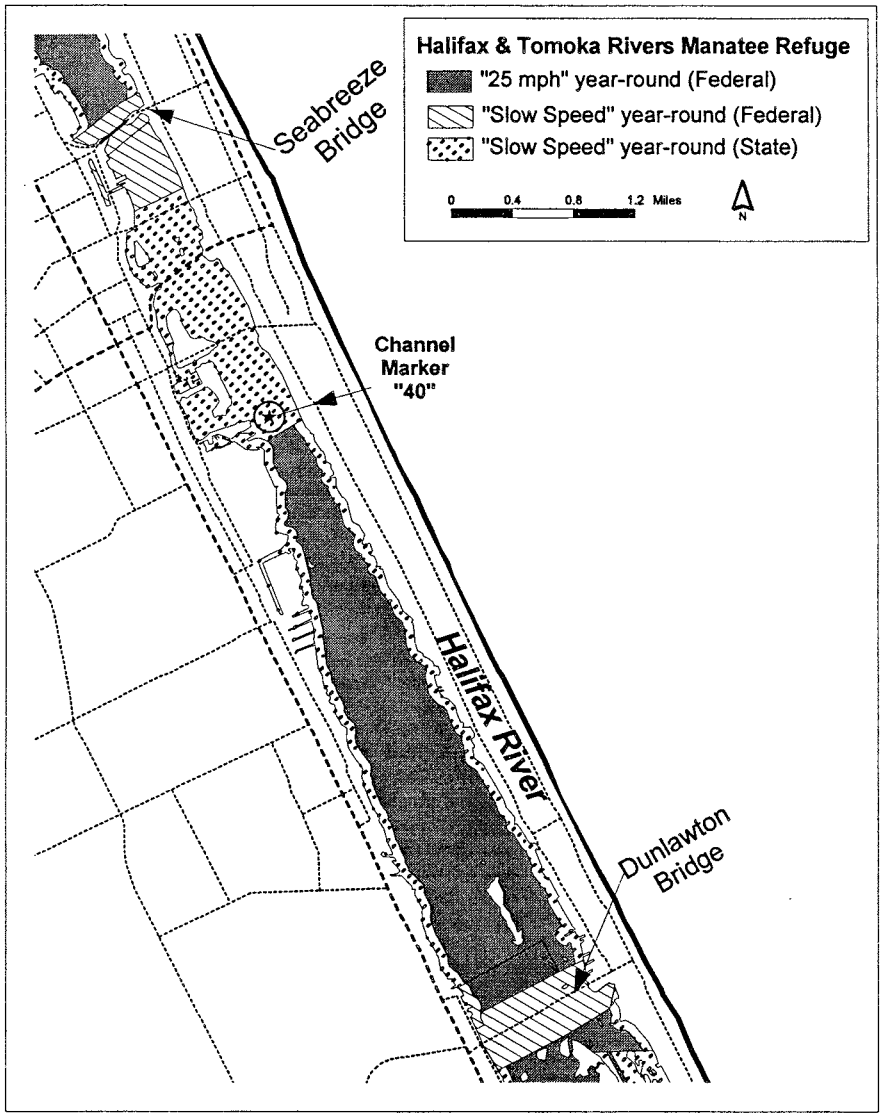
Tomoka River Basin



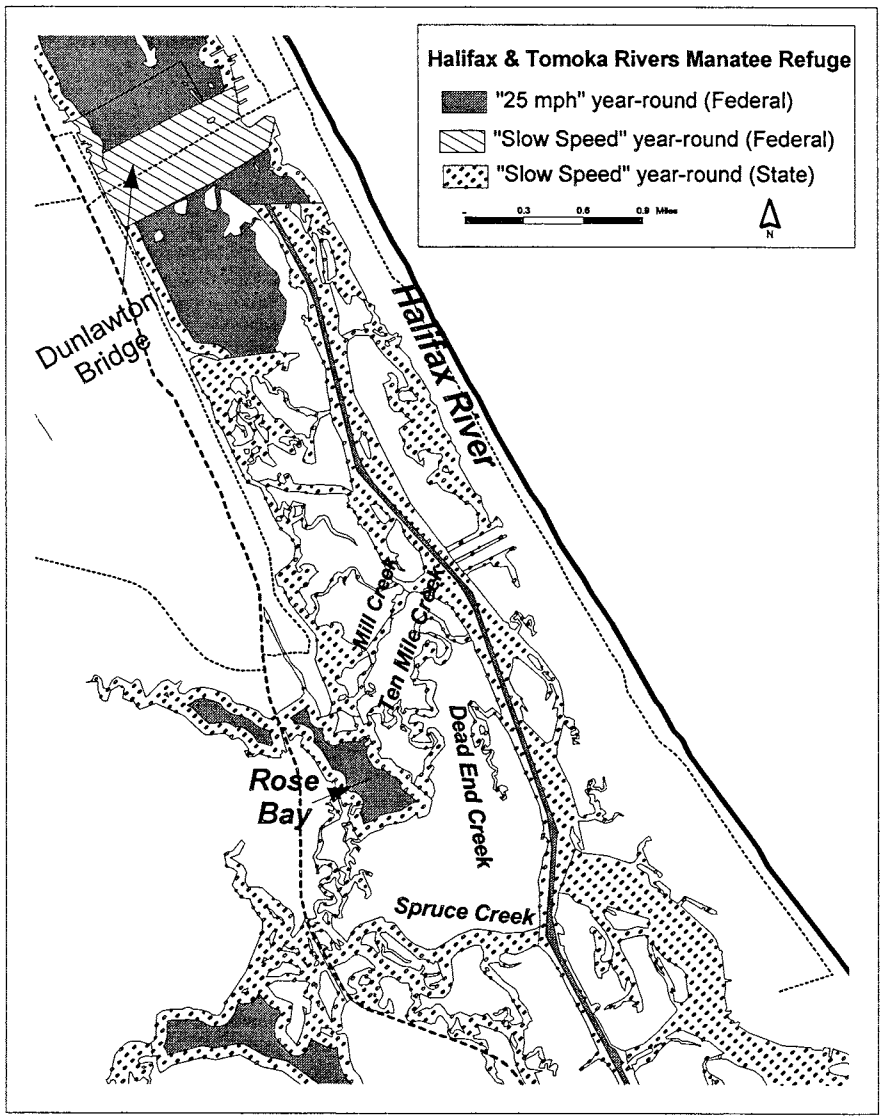
Tomoka River



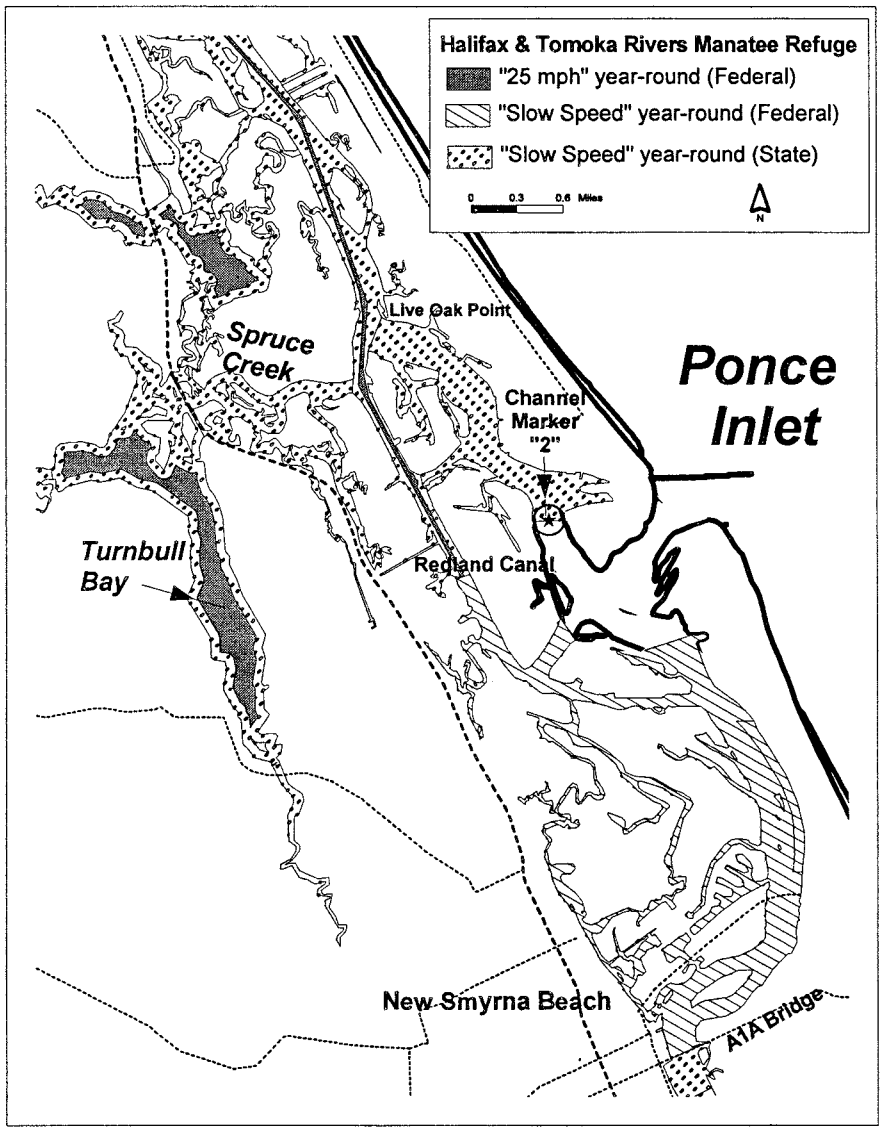
Halifax River A



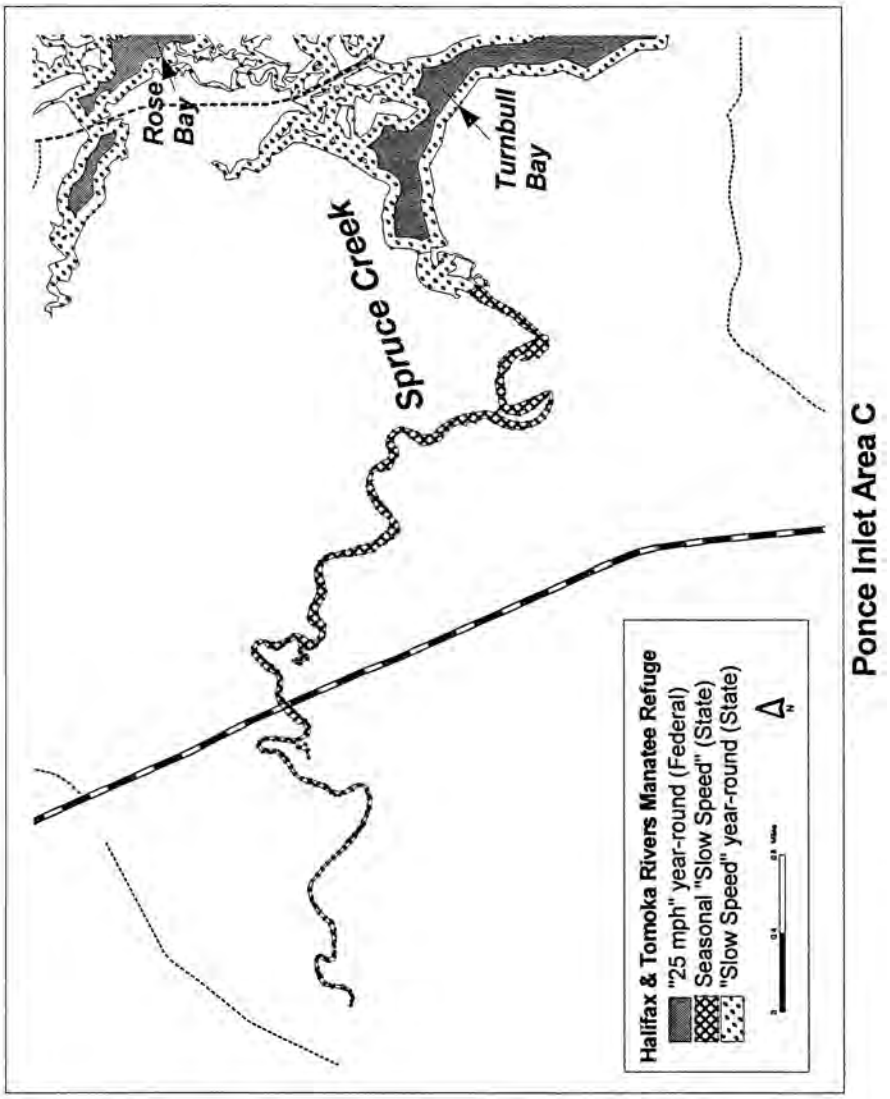
Halifax River B



Ponce Inlet Area A



Ponce Inlet Area B



(13) *The Pine Island-Estero Bay Manatee Refuge.* (i) Watercraft are required to proceed at slow speed all year in all waters of Matlacha Pass, south of a line that bears 90° and 270° from Matlacha Pass Green Channel Marker 77 (approximate latitude 26°40′00″ North, approximate longitude 82°06′00″ West), and north of Pine Island Road (State Road 78), excluding:

(A) The portion of the marked channel otherwise designated in paragraph (c)(13)(iii) of this section;

(B) All waters of Buzzard Bay east and northeast of a line beginning at a point (approximate latitude 26°40′00″ North, approximate longitude 82°05′20″ West) on the southwest shoreline of an unnamed mangrove island east of Matlacha Pass Green Channel Marker

77 and bearing 219° to the northeasternmost point (approximate latitude 26°39′58″ North, approximate longitude 82°05′23″ West) of another unnamed mangrove island, then running along the eastern shoreline of said island to its southeasternmost point (approximate latitude 26°39′36″ North, approximate longitude 82°05′09″ West), then bearing 115° to the westernmost point (approximate latitude 26°39′34″ North, approximate longitude 82°05′05″ West) of the unnamed mangrove island to the southeast, then running along the western shoreline of said island to its southwesternmost point (approximate latitude 26°39′22″ North, approximate longitude 82°04′53″ West), then bearing 123° to the northwesternmost point (approximate latitude 26°39′21″ North, approximate longitude 82°04′52″ West) of an unnamed mangrove island, then running along the western shoreline of said island to its southeasternmost point (approximate latitude 26°39′09″ North, approximate longitude 82°04′44″ West), then bearing 103° to the northwesternmost point (approximate latitude 26°39′08″ North, approximate longitude 82°04′41″ West) of a peninsula on the unnamed mangrove island to the southeast, then running along the southwestern shoreline of said island to its southeasternmost point (approximate latitude 26°38′51″ North, approximate longitude 82°04′18″ West), then bearing 99° to the southernmost point (approximate latitude 26°38′50″ North, approximate longitude 82°04′03″ West) of the unnamed mangrove island to the east, then bearing 90° to the line's terminus at a point (approximate latitude 26°38′50″ North, approximate longitude 82°03′55″ West) on the eastern shoreline of Matlacha Pass; and

(C) All waters of Pine Island Creek and Matlacha Pass north of Pine Island Road (State Road 78) and west and southwest of a line beginning at a point (approximate latitude 26°39′29″ North, approximate longitude 82°06′29″ West) on the western shoreline of Matlacha Pass and bearing 160° to the westernmost point (approximate latitude 26°39′25″ North, approximate longitude 82°06′28″ West) of an unnamed island, then running along the western shoreline of said island to its southernmost point (approximate latitude 26°39′18″ North, approximate longitude 82°06′24″ West), then bearing 128° to the northernmost point (approximate latitude 26°39′12″ North, approximate longitude 82°06′17″ West) of an unnamed mangrove island to the south, then running along the eastern shoreline of said island to its southeasternmost point (approximate latitude 26°39′00″ North, approximate longitude 82°06′09″ West), then bearing 138° to a point (approximate latitude 26°38′45″ North, approximate longitude 82°05′53″ West) on the northern shoreline of Bear Key, then running along the northern shoreline of Bear Key to its easternmost point (approximate latitude 26°38′44″ North, approximate longitude 82°05′46″ West), then bearing 85° to the westernmost point (approximate latitude 26°38′45″ North, approximate longitude 82°05′32″ West) of Deer Key, then running along the northern shoreline of Deer Key to its easternmost point (approximate latitude 26°38′46″ North, approximate longitude 82°05′22″ West), then bearing 103° to the northwesternmost point (approximate latitude 26°38′45″ North, approximate longitude 82°05′17″ West) of the unnamed mangrove island to the east, then running along the western shoreline of said island to its southernmost point (approximate latitude 26°38′30″ North, approximate longitude 82°05′04″ West), then bearing 106° to the westernmost point (approximate latitude 26°38′30″ North, approximate longitude 82°04′57″ West) of the unnamed island to the southeast, then running along the northern and eastern shorelines of said island to a point (approximate latitude 26°38′23″ North, approximate longitude 82°04′51″ West) on its eastern shoreline, then bearing 113° to the northernmost point of West Island (approximate latitude 26°38′21″ North, approximate longitude 82°04′37″ West), then running along the western shoreline of West Island to the point where the line intersects Pine Island Road (State Road 78).

(ii) Watercraft are required to proceed at slow speed all year in all waters of Matlacha Pass, St. James Creek, and San Carlos Bay, south of Pine Island Road (State Road 78), north of a line 500 feet northwest of and parallel to the main marked channel of the Intracoastal Waterway, west of a line that

bears 302° from Intracoastal Waterway Green Channel Marker 99 (approximate latitude 26°31′00″ North, approximate longitude 82°00′52″ West), and east of a line that bears 360° from Intracoastal Waterway Red Channel Marker 10 (approximate latitude 26°29′16″ North, approximate longitude 82°03′35″ West), excluding:

(A) The portions of the marked channels otherwise designated in paragraphs (c)(15)(iv) and (v) of this section;

(B) All waters of Matlacha Pass south of Pine Island Road (State Road 78) and west of the western shoreline of West Island and a line beginning at the southernmost point (approximate latitude 26°37′25″ North, approximate longitude 82°04′17″ West) of West Island and bearing 149° to the northernmost point (approximate latitude 26°37′18″ North, approximate longitude 82°04′12″ West) of the unnamed mangrove island to the south, then running along the eastern shoreline of said island to its southernmost point (approximate latitude 26°36′55″ North, approximate longitude 82°04′02″ West), then bearing 163° to the line's terminus at a point (approximate latitude 26°36′44″ North, approximate longitude 82°03′58″ West) on the eastern shoreline of Little Pine Island;

(C) All waters of Matlacha Pass, Pontoon Bay, and associated embayments south of Pine Island Road (State Road 78) and east of a line beginning at a point (approximate latitude 26°38′12″ North, approximate longitude 82°03′46″ West) on the northwestern shoreline of the embayment on the east side of Matlacha Pass, immediately south of Pine Island Road and then running along the eastern shoreline of the unnamed island to the south to its southeasternmost point (approximate latitude 26°37′30″ North, approximate longitude 82°03′22″ West), then bearing 163° to the northwesternmost point of the unnamed island to the south, then running along the western shoreline of said island to its southernmost point (approximate latitude 26°37′15″ North, approximate longitude 82°03′15″ West), then bearing 186° to the line's terminus at a point (approximate latitude 26°37′10″ North, approximate longitude 82°03′16″ West) on the eastern shoreline of Matlacha Pass;

(D) All waters of Pine Island Creek south of Pine Island Road (State Road 78); and all waters of Matlacha Pass, Rock Creek, and the Mud Hole, west of a line beginning at a point (approximate latitude 26°33′52″ North, approximate longitude 82°04′53″ West) on the western shoreline of Matlacha Pass and bearing 22° to a point (approximate latitude 26°34′09″ North, approximate longitude 82°04′45″ West) on the southern shoreline of the unnamed island to the northeast, then running along the southern and eastern shorelines of said island to a point (approximate latitude 26°34′15″ North, approximate longitude 82°04′39″ West) on its northeastern shoreline, then bearing 24° to a point (approximate latitude 26°34′21″ North, approximate longitude 82°04′36″ West) on the southern shoreline of the large unnamed island to the north, then running along the southern and eastern shorelines of said island to a point (approximate latitude 26°34′31″ North, approximate longitude 82°04′29″ West) on its eastern shoreline, then bearing 41° to the southernmost point (approximate latitude 26°34′39″ North, approximate longitude 82°04′22″ West) of another unnamed island to the northeast, then running along the eastern shoreline of said island to its northwesternmost point (approximate latitude 26°35′22″ North, approximate longitude 82°04′07″ West), then bearing 2° to the southernmost point (approximate latitude 26°35′32″ North, approximate longitude 82°04′07″ West) of the unnamed island to the north, then running along the eastern shoreline of said island to its northernmost point (approximate latitude 26°35′51″ North, approximate longitude 82°03′59″ West), then bearing 353° to the line's terminus at a point (approximate latitude 26°36′08″ North, approximate longitude 82°04′01″ West) on the eastern shoreline of Little Pine Island; and

(E) All waters of Punta Blanca Bay and Punta Blanca Creek, east of the eastern shoreline of Matlacha Pass and east and north of the eastern and northern shorelines of San Carlos Bay.

(iii) Watercraft may not exceed 25 miles per hour, all year, in all waters within the main marked channel in Matlacha Pass south of Green Channel Marker 77 (approximate latitude

26°40′00″ North, approximate longitude 82°06′00″ West) and north of a line perpendicular to the channel at a point in the channel ¼ mile northwest of the Pine Island Road Bridge (State Road 78).

(iv) Watercraft may not exceed 25 miles per hour, all year, in all waters within the main marked channel in Matlacha Pass south of a line perpendicular to the channel at a point in the channel ¼ mile southeast of the Pine Island Road Bridge (State Road 78), and north of a line 500 feet northwest of and parallel to the main marked channel of the Intracoastal Waterway (just north of Green Channel Marker 1).

(v) Watercraft may not exceed 25 miles per hour, all year, in all waters within the marked channel in Matlacha Pass that intersects the main Matlacha Pass channel near Green Channel Marker 15 (approximate latitude 26°31′57″ North, approximate longitude 82°03′38″ West) and intersects the main marked channel of the Intracoastal Waterway near Green Channel Marker 101 (approximate latitude 26°30′39″ North, approximate longitude 82°01′00″ West).

(vi) Watercraft are required to proceed at slow speed from April 1 through November 15 in all canals and boat basins of St. James City and the waters known as Long Cut and Short Cut; and all waters of Pine Island Sound and San Carlos Bay south of a line beginning at the southernmost tip (approximate latitude 26°31′28″ North, approximate longitude 82°06′19″ West) of a mangrove peninsula on the western shore of Pine Island approximately 2200 feet north of Galt Island and bearing 309° to the southeasternmost point (approximate latitude 26°31′32″ North, approximate longitude 82°06′25″ West) of another mangrove peninsula, then running along the southern shoreline of said peninsula to its southwesternmost point (approximate latitude 26°31′40″ North, approximate longitude 82°06′38″ West), then bearing 248° to a point (approximate latitude 26°31′40″ North, approximate longitude 82°06′39″ West) on the eastern shoreline of an unnamed mangrove island, then running along the southern shoreline of said island to its southwesternmost point (approximate latitude 26°31′39″ North, approximate longitude 82°06′44″ West), then bearing 206° to the line's terminus at the northernmost point of the Mac Keever Keys (approximate latitude 26°31′09″ North, approximate longitude 82°07′09″ West), east of a line beginning at said northernmost point of the Mac Keever Keys and running along and between the general contour of the western shorelines of said keys to a point (approximate latitude 26°30′27″ North, approximate longitude 82°07′08″ West) on the southernmost of the Mac Keever Keys, then bearing 201° to a point (approximate latitude 26°30′01″ North, approximate longitude 82°07′19″ West) approximately 150 feet due east of the southeasternmost point of Chino Island, then bearing approximately 162° to Red Intracoastal Waterway Channel Marker 22 (approximate latitude 26°28′57″ North, approximate longitude 82°06′55″ West), then bearing approximately 117° to the line's terminus at Red Intracoastal Waterway Channel Marker 20 (approximate latitude 26°28′45″ North, approximate longitude 82°06′38″ West), north of a line beginning at said Red Intracoastal Waterway Channel Marker 20 and bearing 86° to a point (approximate latitude 26°28′50″ North, approximate longitude 82°05′48″ West) ¼ mile south of York Island, then running parallel to and ¼ mile south of the general contour of the southern shorelines of York Island and Pine Island to the line's terminus at a point on a line bearing 360° from Red Intracoastal Waterway Channel Marker 10 (approximate latitude 26°29′16″ North, approximate longitude 82°03′35″ West), and west and southwest of the general contour of the western and southern shorelines of Pine Island and a line that bears 360° from said Red Intracoastal Waterway Channel Marker 10, excluding the portion of the marked channel otherwise designated in paragraph (c)(13)(vii) of this section.

(vii) Watercraft may not exceed 25 miles per hour from April 1 through November 15 in all waters of the marked channel that runs north of the power lines from the Cherry Estates area of St. James City into Pine Island Sound, east of the western boundary of the zone designated in 17.108(c)(13)(vi), and west of a line perpendicular to the

power lines that begins at the easternmost point (approximate latitude 26°30′25″ North, approximate longitude 82°06′15″ West) of the mangrove island on the north side of the power lines approximately 1,800 feet southwest of the Galt Island Causeway.

(viii) Watercraft are required to proceed at slow speed all year in all waters of San Carlos Bay and Punta Rassa Cove east of a line that bears 352° from the northernmost tip of the northern peninsula on Punta Rassa (approximate latitude 26°29′44″ North, approximate longitude 82°00′33″ West), and south of a line that bears 122° from Intracoastal Waterway Green Channel Marker 99 (approximate latitude 26°31′00″ North, approximate longitude 82°00′52″ West), including all waters of Shell Creek and associated waterways.

(ix) Watercraft are required to proceed at slow speed all year in all waters of San Carlos Bay and the Caloosahatchee River, including the residential canals of Cape Coral, northeast of a line that bears 302° and 122° from Intracoastal Waterway Green Channel Marker 99 (approximate latitude 26°31′00″ North, approximate longitude 82°00′52″ West), west of a line that bears 346° from Intracoastal Waterway Green Channel Marker 93 (approximate latitude 26°31′37″ North, approximate longitude 81°59′46″ West), and north and northwest of the general contour of the northwestern shoreline of Shell Point and a line that bears approximately 74° from the northernmost tip (approximate latitude 26°31′31″ North, approximate longitude 81°59′57″ West) of Shell Point to said Intracoastal Waterway Green Channel Marker 93, excluding the Intracoastal Waterway between markers 93 and 99 (which is already designated as a Federal manatee protection area, requiring watercraft to proceed at slow speed, and is not impacted by this rule).

(x) Watercraft are required to proceed at slow speed from April 1 through November 15 and at not more than 25 miles per hour the remainder of the year in all waters of Hell Peckney Bay southeast of Hurricane Bay, northeast of the northern shorelines of Julies Island and the unnamed island immediately northwest of Julies Island and a line that bears 312° from the northwesternmost point of Julies Island (approximate latitude 26°26′37″ North, approximate longitude 81°54′57″ West), northwest of Estero Bay, and southwest of a line beginning at the southernmost point (approximate latitude 26°27′23″ North, approximate longitude 81°55′11″ West) of an unnamed mangrove peninsula in northwest Hell Peckney Bay and bearing 191° to the northernmost point (approximate latitude 26°27′19″ North, approximate longitude 81°55′11″ West) of an unnamed mangrove island, then running along the northern shoreline of said island to its southeasternmost point (approximate latitude 26°27′11″ North, approximate longitude 81°55′05″ West), then bearing 115° to a point (approximate latitude 26°27′03″ North, approximate longitude 81°54′47″ West) on the northwest shoreline of an unnamed mangrove island, then running along the northern shoreline of said island to its northeasternmost point (approximate latitude 26°27′02″ North, approximate longitude 81°54′33″ West), and then bearing 37° to the line's terminus at the westernmost point of an unnamed mangrove peninsula in eastern Hell Peckney Bay.

(xi) Watercraft are required to proceed at slow speed from April 1 through November 15 and at not more than 25 miles per hour the remainder of the year in all waters of Hendry Creek south of a line that bears 270° from a point (approximate latitude 26°28′40″ North, approximate longitude 81°52′56″ West) on the eastern shoreline of Hendry Creek; and all waters of Estero Bay southeast and east of Hell Peckney Bay, a line that bears 340° from a point (approximate latitude 26°25′56″ North, approximate longitude 81°54′25″ West) on the northern tip of an unnamed mangrove peninsula on the northeastern shoreline of Estero Island, and the northern shoreline of Estero Island, south of Hendry Creek and a line that bears 135° and 315° from Red Channel Marker 18 (approximate latitude 26°27′46″ North, approximate longitude 81°52′00″ West) in Mullock Creek, and north of a line that bears 72° from the northernmost point (approximate latitude 26°24′22″ North, approximate longitude 81°52′34″ West) of Black Island,

including the waters of Buccaneer Lagoon at the southern end of Estero Island, but excluding:

(A) The portions of the marked channels otherwise designated in paragraph (c)(13)(xiii) of this section;

(B) The Estero River; and

(C) To waters of Big Carlos Pass east of a line beginning at a point (approximate latitude 26°24′34″ North, approximate longitude 81°53′05″ West) on the eastern shoreline of Estero Island and bearing 36° to a point (approximate latitude 26°24′40″ North, approximate longitude 81°53′00″ West) on the southern shoreline of Coon Key, south of a line beginning at a point (approximate latitude 26°24′36″ North, approximate longitude 81°52′30″ West) on the eastern shoreline of Coon Key and bearing 106° to a point (approximate latitude 26°24′39″ North, approximate longitude 81°52′34″ West) on the southwestern shoreline of the unnamed mangrove island north of Black Island, and west of a line beginning at a point (approximate latitude 26°24′36″ North, approximate longitude 81°52′30″ West) on the southern shoreline of said unnamed mangrove island north of Black Island and bearing 192° to the northernmost point (approximate latitude 26°24′22″ North, approximate longitude 81°52′34″ West) of Black Island.

(xii) Watercraft are required to proceed at slow speed from April 1 through November 15 and at not more than 25 miles per hour the remainder of the year in all waters of Estero Bay and Big Hickory Bay south of a line that bears 72° from the northernmost point (approximate latitude 26°24′22″ North, approximate longitude 81°52′34″ West) of Black Island, east of the centerline of State Road 865 (but including the waters of the embayment on the eastern side of Black Island and the waters inshore of the mouth of Big Hickory Pass that are west of State Road 865), and north of a line that bears 90° from a point (approximate latitude 26°20′51″ North, approximate longitude 81°50′33″ West) on the eastern shoreline of Little Hickory Island, excluding Spring Creek and the portions of the marked channels otherwise designated under 17.108(c)(13)(xiii) and the portion of Hickory Bay designated in paragraph (c)(13)(xiii) of this section.

(xiii) Watercraft may not exceed 25 miles per hour all year in:

(A) All waters of Big Hickory Bay north of a line that bears 90° from a point (approximate latitude 26°20′51'' North, approximate longitude 81°50′33″ West) on the eastern shoreline of Little Hickory Island, west of a line beginning at a point (approximate latitude 26°20′48″ North, approximate longitude 81°50′24″ West) on the southern shoreline of Big Hickory Bay and bearing 338° to a point (approximate latitude 26°21′39″ North, approximate longitude 81°50′48″ West) on the water in the northwestern end of Big Hickory Bay near the eastern end of Broadway Channel, south of a line beginning at said point on the water in the northwestern end of Big Hickory Bay and bearing 242° to the northernmost point (approximate latitude 26°21′39″ North, approximate longitude 81°50′50″ West) of the unnamed mangrove island south of Broadway Channel, and east of the eastern shoreline of said mangrove island and a line beginning at the southernmost point of said island (approximate latitude 26°21′07″ North, approximate longitude 81°50′58″ West) and bearing 167° to a point on Little Hickory Island (approximate latitude 26°21′03″ North, approximate longitude 81°50′57″ West);

(B) All waters of the main marked North–South channel in northern Estero Bay from Green Channel Marker 37 (approximate latitude 26°26′02 North, approximate longitude 81°54′29″ West) to Green Channel Marker 57 (approximate latitude 26°25′08″ North, approximate longitude 81°53′29″ West);

(C) All waters of the main marked North-South channel in southern Estero Bay south of a line beginning at a point (approximate latitude 26°24′36″ North, approximate longitude 81°52′30″ West) on the southern shoreline of the unnamed mangrove island north of Black Island and bearing 192° to the northernmost point (approximate latitude 26°24′22″ North, approximate longitude 81°52′34″ West) of Black Island, and north and east of Red Channel Marker 62 (approximate latitude 26°21′31″ North, approximate longitude 81°51′20″ West) in Broadway Channel;

(D) All waters within the portion of the marked channel leading to the Gulf

of Mexico through New Pass, west of the North-South channel and east of State Road 865; all waters of the marked channel leading to Mullock Creek north of a line beginning at a point (approximate latitude 26°24′36″ North, approximate longitude 81°52′30″ West) on the eastern shoreline of Coon Key and bearing 106° to a point (approximate latitude 26°24′39″ North, approximate longitude 81°52′34″ West) on the southwestern shoreline of the unnamed mangrove island north of Black Island, and south of Red Channel Marker 18 (approximate latitude 26°27′46″ North, approximate longitude 81°52′00″ West);

(E) All waters of the marked channel leading from the Mullock Creek Channel to the Estero River, west of the mouth of the Estero River. (This designation only applies if a channel is marked in accordance with permits issued by all applicable State and federal authorities. In the absence of a properly permitted channel, this area is as designated under paragraph (c)(13)(xi) of this section);

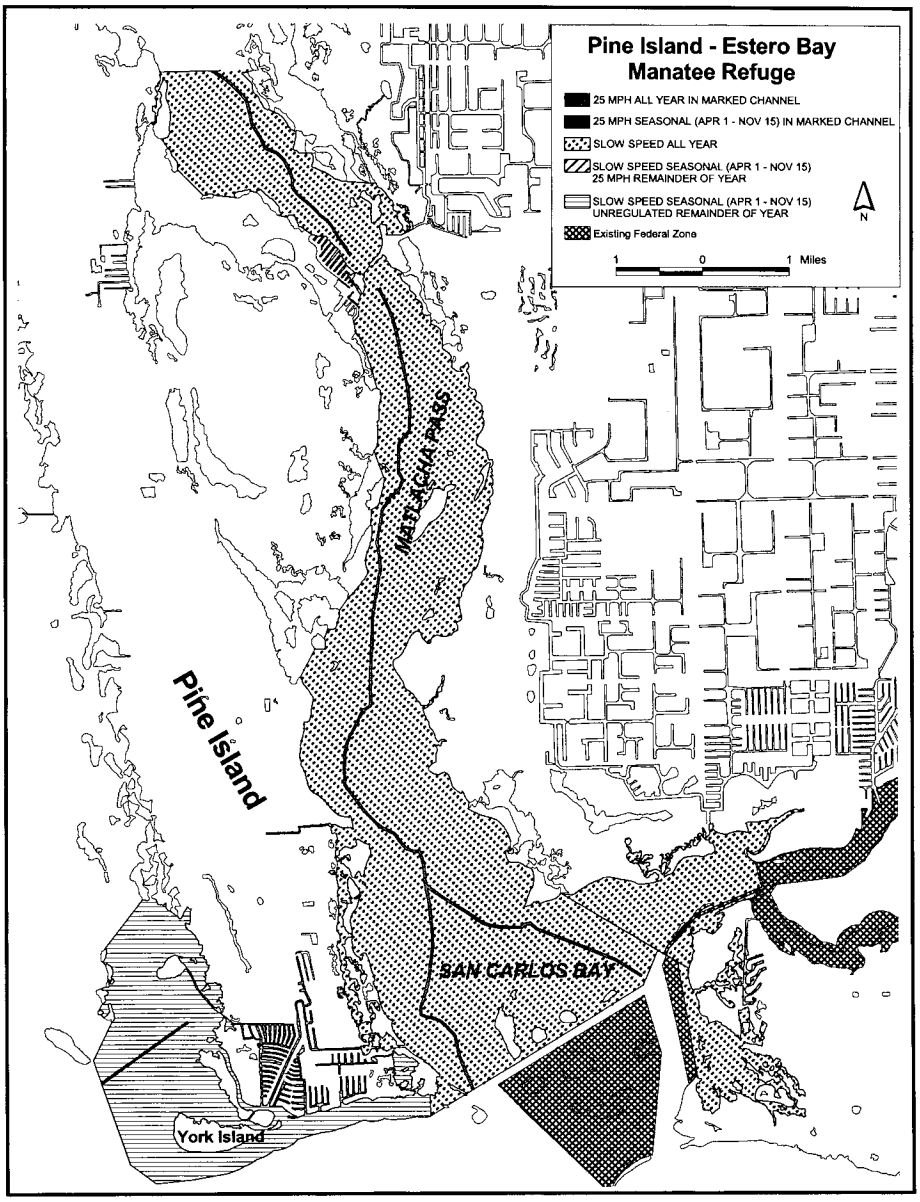
(F) All waters of the marked channel commonly known as Alternate Route Channel, with said channel generally running between Channel Marker 1 (approximate latitude 26°24′29″ North, approximate longitude 81°51′53″ West) and Channel Marker 10 (approximate latitude 26°24′00″ North, approximate longitude 81°51′09″ West);

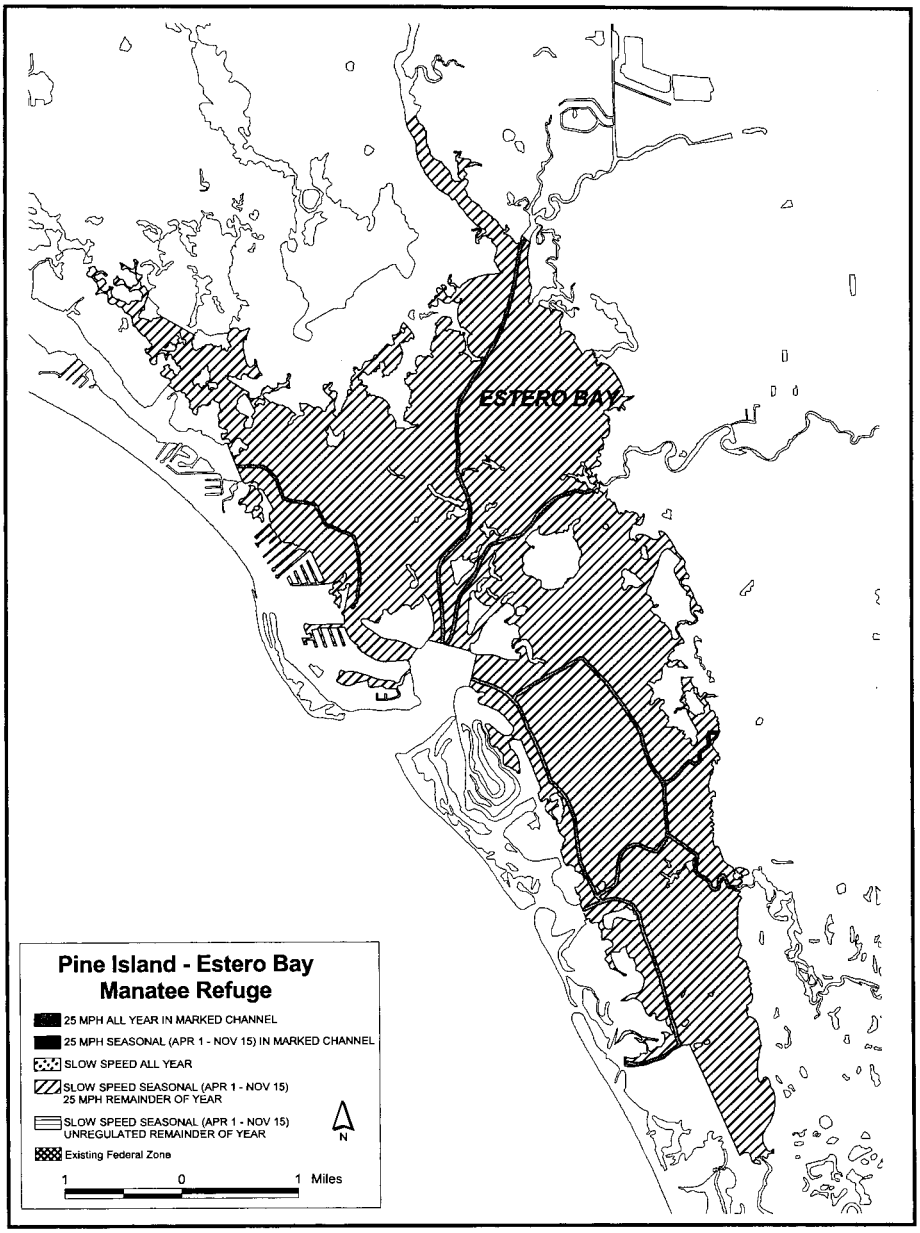
(G) All waters of the marked channel commonly known as Coconut Channel, with said channel generally running between Channel Marker 1 (approximate latitude 26°23′44″ North, approximate longitude 81°50′55″ West) and Channel Marker 23 (approximate latitude 26°24′00″ North, approximate longitude 81°50′30″ West);

(H) All waters of the marked channel commonly known as Southern Passage Channel, with said channel generally running between Channel Marker 1 (approximate latitude 26°22′58″ North, approximate longitude 81°51′57″ West) and Channel Marker 22 (approximate latitude 26°23′27″ North, approximate longitude 81°50′46″ West); and

(I) All waters of the marked channel leading from the Southern Passage Channel to Spring Creek, west of the mouth of Spring Creek.

(xiv) Maps of the Pine Island-Estero Bay Manatee Refuge follow:


Pine Island - Estero Bay
Manatee Refuge
25 MPH ALL YEAR IN MARKED CHANNEL
25 MPH SEASONAL (APR 1 - NOV 15) IN MARKED CHANNEL
SLOW SPEED ALL YEAR
SLOW SPEED SEASONAL (APR 1 - NOV 15)
25 MPH REMAINDER OF YEAR
SLOW SPEED SEASONAL (APR 1 - NOV 15)
UNREGULATED REMAINDER OF YEAR
Existing Federal Zone
1 0 1 Miles
N
MATLACHA PASS
Pine Island
SAN CARLOS BAY
York Island

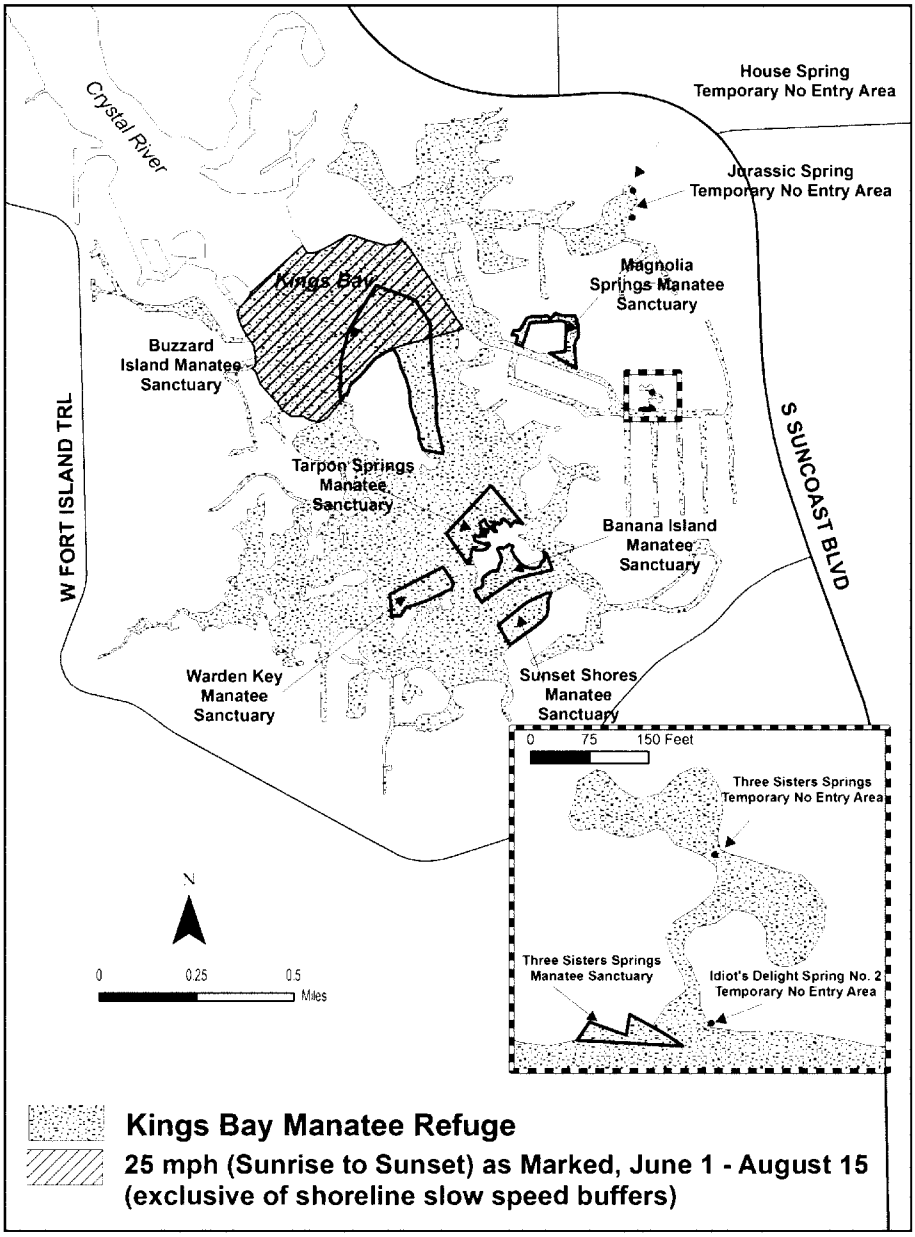


(14) *The Kings Bay Manatee Refuge.* A tract of submerged land that includes all waters of Kings Bay, including all tributaries and adjoining waterbodies, upstream of the confluence of Kings Bay and Crystal River, described by a line that bears North 53°00′00″ East (True) from the northeasternmost point of an island on the southwesterly shore of Crystal River (approximate

latitude 28°53′32″ North, approximate longitude 82°36′23″ West) to the southwesternmost point of a peninsula of Magnolia Shores (approximate latitude 28°53′38″ North, approximate longitude 82°36′16″ West).

(i) *Area covered.* The Kings Bay Manatee Refuge encompasses existing manatee protection areas as described in paragraphs (a)(1) through (a)(7) of this section, and areas outside these sections as depicted on the map in paragraph (c)(14)(ii) of this section.

(ii) *Particular areas.* The following springs fall within the boundaries of the Kings Bay Manatee Refuge. A map showing the entire refuge, including these springs, follows:



(A) *Three Sisters Springs.* A tract of submerged land, lying in Section 28, Township 18 South, Range 17 East, Tallahassee Meridian, Citrus County, Florida, more particularly described as follows: For a point of reference, commence at the northwest corner of said

Section 28 in an east southeast direction to the canal that begins on the west side of Southeast Cutler Spur Boulevard and runs west-northwest to Kings Bay. The spring is north and east of the northern terminus of Southeast Paradise Avenue along the northern shore of said canal. Three Sisters Springs includes three main and numerous smaller spring vents and a spring run that connects the vents to said canal in Crystal River, Citrus County, Florida. This area is not the same as set forth in paragraph (a)(7) of this section. This area is behind the sanctuary (north from the mouth of the channel) as set forth in paragraph (a)(7) of this section.

(*1*) All waterborne activities in this specific area are prohibited from sunset to sunrise from November 15 through March 31 exclusive of the provisions of paragraph (c)(14)(v) of this section.

(*2*) Scuba diving and fishing (including but not limited to fishing by hook and line, by cast net, and by spear) are also prohibited in this specific area from November 15 through March 31 exclusive of the provisions of paragraph (c)(14)(v) of this section.

(*3*) If the provisions of paragraph (c)(14)(vi) of this section are put in effect, all waterborne activities are prohibited in this specific area for the duration established under paragraph (c)(14)(vi) of this section.

(B) *House Spring.* A tract of submerged land, lying in Section 21, Township 18 South, Range 17 East, Tallahassee Meridian, Citrus County, Florida, more particularly described as follows: For a point of reference, commence at the southwest corner of said Section 21 in an east-northeast direction to the northeasternmost corner of Hunter Spring Run. The spring is immediately west of and adjacent to Northeast 2nd Court in Crystal River, Citrus County, Florida.

(C) *Jurassic Spring.* A tract of submerged land, lying in Section 21, Township 18 South, Range 17 East, Tallahassee Meridian, Citrus County, Florida, more particularly described as follows: For a point of reference, commence at the southwest corner of said Section 21 in an east northeast direction to the eastern shore of Hunter Spring Run. The spring is immediately west of the western terminus of Bayshore Drive in Crystal River, Citrus County, Florida.

(D) *Idiot's Delight Number 2 Spring.* A tract of submerged land, lying in Section 28, Township 18 South, Range 17 East, Tallahassee Meridian, Citrus County, Florida, more particularly described as follows: For a point of reference, commence at the northwest corner of said Section 28 in an east southeast direction to the canal that begins on the west side of Southeast Cutler Spur Boulevard and runs west-northwest to Kings Bay. The spring is north and east of the northern terminus of Southeast Paradise Avenue along the northern shore of said canal just east of the southern terminus of the Three Sisters Springs run in Crystal River, Citrus County, Florida.

(iii) *Speed and anchoring restrictions.* (A) Throughout the entire year, watercraft speeds are restricted to slow speed throughout the manatee refuge with the following exceptions:

(*1*) A posted area generally north of Buzzard Island, exclusive of shoreline slow-speed buffer zones, where watercraft may travel at speeds up to 25 miles per hour during daylight hours (sunrise to sunset) from June 1 through August 15;

(*2*) Those areas where access is precluded (manatee sanctuaries, no-entry areas); or

(*3*) Areas where more restrictive speed restrictions are in effect.

(B) From June 1 through August 15, anchorage (other than emergency anchorage) of watercraft is prohibited in the posted high speed (25 miles per hour) area around Buzzard Island referenced in paragraph (c)(14)(iii)(A) of this section.

(iv) *Time and area prohibitions.* When the provisions of paragraphs (c)(14)(v) or (vi) of this section are in effect (November 15 through March 31 and April 1 through November 14, respectively), all waterborne activities, including swimming, diving (including skin and scuba diving), snorkeling, water skiing, surfing, fishing (including with hook and line, by cast net, or spear), and the use of water vehicles (including but not limited to boats powered by engine, wind, or other means; ships powered by engine, wind, or other means; barges,

surfboards, personal watercraft, water skis, and any other devices or mechanisms capable of locomotion on, across, or underneath the surface of the water) are prohibited in areas that are adjacent to and within specified distances from the existing manatee sanctuaries located in Kings Bay (defined in paragraphs (a)(1) through (a)(7) of this section) and the springs defined in paragraph (c)(14)(ii) of this section: Three Sisters Springs, House Spring, Jurassic Spring, and Idiot's Delight Number 2 Spring.

(v) *Expanded temporary no-entry area (November 15 through March 31).* When manatees exceed the capacity of an existing manatee sanctuary or shift usage around an existing manatee sanctuary or shift usage to Three Sisters Springs, House Spring, Jurassic Spring, and Idiot's Delight Number 2 Spring, due to water or weather or other conditions, we will designate ''no-entry'' areas from November 15 through March 31 as appropriate and necessary around any of these sites. The determination to designate and subsequently remove no-entry areas around existing manatee sanctuaries and Three Sisters Springs, House Spring, Jurassic Spring, and Idiot's Delight Number 2 Spring within the Kings Bay Manatee Refuge will be based on aerial survey observations of manatees using the existing sanctuary sites, current weather information, and other sources of credible, relevant information. We will designate no-entry areas within Kings Bay Manatee Refuge and outside of existing sanctuaries as follows:

(A) For the sanctuaries set forth in paragraphs (a)(1) through (a)(6) of this section, to a distance not to exceed 100 feet from the existing sanctuary boundary.

(B) For the Three Sisters Springs Sanctuary, to a distance not to exceed 400 feet from the existing boundary. We do not intend to completely mark off the manmade channel. Expansions could occur directly around the existing sanctuary and north into the area locally known as Three Sisters Springs.

(C) For House Spring and Jurassic Spring, an area that does not exceed 100 feet from the associated spring vents.

(D) For Idiot's Delight Number 2 Spring, an area that does not exceed 25 feet from the associated spring vent. Any temporary designation will be configured to avoid the manmade channel in the canal and will not block access into Three Sisters Springs.

(vi) *Temporary no-entry areas (April 1 through November 14).* Temporary no-entry area designations may be made in the existing manatee sanctuaries located in Kings Bay defined in paragraphs (a)(1) through (a)(7) and paragraphs (c)(14)(v)(A) through (D) of this section prior to November 15 and after March 31 during cold fronts when manatees are present. Designations will remain in effect for the duration of a cold front and only when there is regular manatee use; temporary no-entry area designations will remain in effect for no longer than 14 consecutive days.

(vii) *Posting of temporary no-entry areas designated in accordance with paragraph (c)(14)(v) or (vi) of this section.* Additional temporary protection areas will be posted to distances as described in paragraph (c)(14)(v) of this section and identified by the following devices: buoys, float lines, signs, advisories from onsite Service employees and their designees, or other methods.

(viii) *Notifications of temporary no-entry areas designated in accordance with paragraph (c)(14)(v) or (vi) of this section.* When we determine that the provisions of paragraph (c)(14)(v) or (vi) of this section are appropriate, the temporary protection areas will be designated and posted to distances as described in paragraph (c)(14)(v) of this section. No-entry area designations will occur immediately. We will advise the public of designations through public notice(s) announcing and describing the measures in a local newspaper and other media, including but not limited to, local television and radio broadcasts, Web sites and other news outlets, as soon as time permits. Onsite Service employees and their designees, when present, may also inform waterway users of designations.

(ix) *Prohibited activities (year-round).* We specifically identify and prohibit the activities set forth in this paragraph to prevent the take of one or

more manatees by individuals engaged in waterborne activities while in the water, in boats, or on-shore within the Kings Bay Manatee Refuge. In regard to these prohibited activities, we consider a resting manatee to be a mostly motionless manatee that rises to breathe from the water bottom, in the water column, or on the water's surface. While resting, a manatee may make minor changes in its posture and may slightly shift its position. Minor changes in posture occur when resting manatees breathe or roll. Resting manatees may also make slight movements with their flippers or tail to compensate for drift, etc. Prohibited activities include:

(A) Chasing or pursuing manatee(s).

(B) Disturbing or touching a resting or feeding manatee(s).

(C) Diving from the surface on to a resting or feeding manatee(s).

(D) Cornering or surrounding or attempting to corner or surround a manatee(s).

(E) Riding, holding, grabbing, or pinching or attempting to ride, hold, grab, or pinch a manatee(s).

(F) Poking, prodding, or stabbing or attempting to poke, prod, or stab a manatee(s) with anything, including your hands and feet.

(G) Standing on or attempting to stand on manatee(s).

(H) Separating a mother and calf or attempting to separate a mother and calf.

(I) Separating manatee(s) from a group or attempting to separate manatee(s) from a group.

(J) Giving manatee(s) anything to eat or drink or attempting to give manatee(s) anything to eat or drink.

(K) Actively initiating contact with belted or tagged manatee(s) and associated gear, including any belts, harnesses, tracking devices, or antennae.

(L) Interfering with rescue and research activities.

[45 FR 74881, Nov. 12, 1980, as amended at 57 FR 5990, Feb. 19, 1992; 59 FR 24658, May 12, 1994; 63 FR 55556, Oct. 16, 1998; 67 FR 693, Jan. 7, 2002; 67 FR 66473, Nov. 8, 2002; 68 FR 46898, Aug. 6, 2003; 69 FR 40805, July 7, 2004; 70 FR 17874, Apr. 7, 2005; 70 FR 21969, Apr. 28, 2005; 70 FR 29458, May 23, 2005; 77 FR 15631, Mar. 16, 2012]

Appendix E

Manatee Population Aerial Surveys

And

Visitor Use Reports

Highest numbers of manatees recorded between September and March from annual aerial surveys over Homosassa River, Kings Bay/Crystal River, and other Aggregation Areas

Winter manatee counts in the Homosassa River, Kings Bay/Crystal River and the entire aggregation area based on aerial surveys from September through March

	Aerial Survey Maximum			
Season	Homosassa River	Kings Bay/ Crystal River	Aggregation Area	Flight Frequency
1967-68	8	38	50	Cold fronts-Hartman
1968-69	--	44	55	Cold fronts-Hartman
1972-73	12	45	61	Intermittent-Hartman
1973-74	18	44	---	Intermittent-Hartman
1974-75	--	47	---	Intermittent-Powell
1975-76	--	51	---	Intermittent-Powell
1976-77	--	37	54	Bimonthly-Powell
1977-78	11	78	98	At least weekly-Packard & Mulholland
1978-79	29	85	103	At least weekly-Packard & Mulholland
1979-80	16	87	93	At least weekly-Packard & Mulholland
1980-81	24	97	111	At least weekly-Packard & Mulholland
1981-82	20	125	127	Cold fronts-Powell
1982-83	21	118	150	At least weekly
1983-84	43	124	142	At least weekly
1984-85	24	116	129	Bimonthly
1985-86	51	115	136	At least weekly with Packard method
1986-87	45	154	204	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1987-88	53	158	201	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1988-89	46	174	220	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1989-90	41	250	286	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1990-91	37	242	280	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1991-92	47	213	260	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1992-93	63	245	292	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1993-94	44	226	270	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1994-95	45	274	303	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1995-96	68	255	304	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1996-97	91	211	297	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1

Continued on the next page.

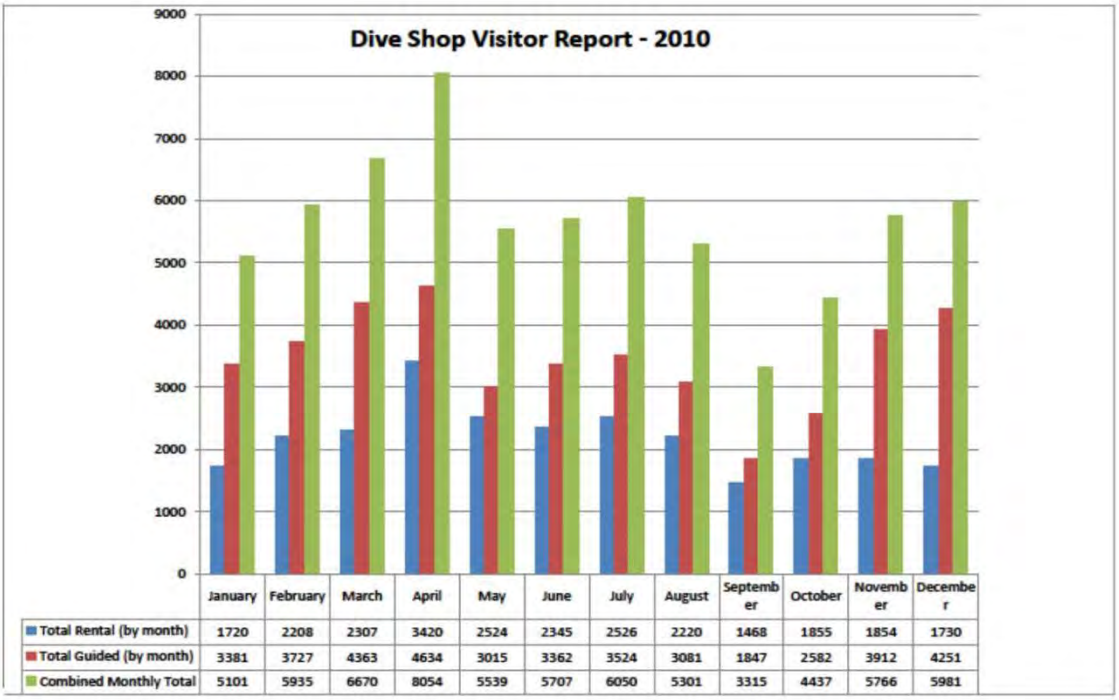
1997-98	115	288	369	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1998-99	123	235	366	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
1999-00	94	254	337	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
2000-01	115	305	386	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
2001-02	104	263	389	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
2002-03	82	282	348	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
2003-04	127	255	393	Semimonthly Sep. 1 to Nov. 15 & March; weekly Nov.15-Mar.1
2004-05	125	273	430	Semimonthly Sep. 1 to Nov. 15; Weekly Dec.; semimonthly Jan.-Mar.
2005-06	124	310	438	Semimonthly Sep. 1 to Nov. 15; Weekly Dec.; semimonthly Jan.-Mar.
2006-07	116	267	424	Semimonthly year-round; additional surveys following cold fronts.
2007-08	66	240	365	Semimonthly year-round; additional surveys following cold fronts.
2008-09	156	347	476	Semimonthly year-round; additional surveys following cold fronts.
2009-10	153	566	646	Semimonthly year-round; additional surveys following cold fronts.
2010-11	101	519	621	Semimonthly year-round; additional surveys following cold fronts.
2011-12	89	549	657	Semimonthly year-round
2012-13	118	314	473	Semimonthly year-round
2013-14	186	560	639	Semimonthly year-round

Surveys from 1983 to present-USFWS
Surveys from 1990 to present-USFWS-Kleen, sometimes Quarles

Note: Numbers are not additive, as peak numbers may have been recorded during different surveys.

Data provided by U.S. Fish and Wildlife Service, Crystal River National Wildlife Refuge Complex, Crystal River, Florida

Visitor use reported by Commercial Special Use Permit Holders to Crystal River NWR in 2010.

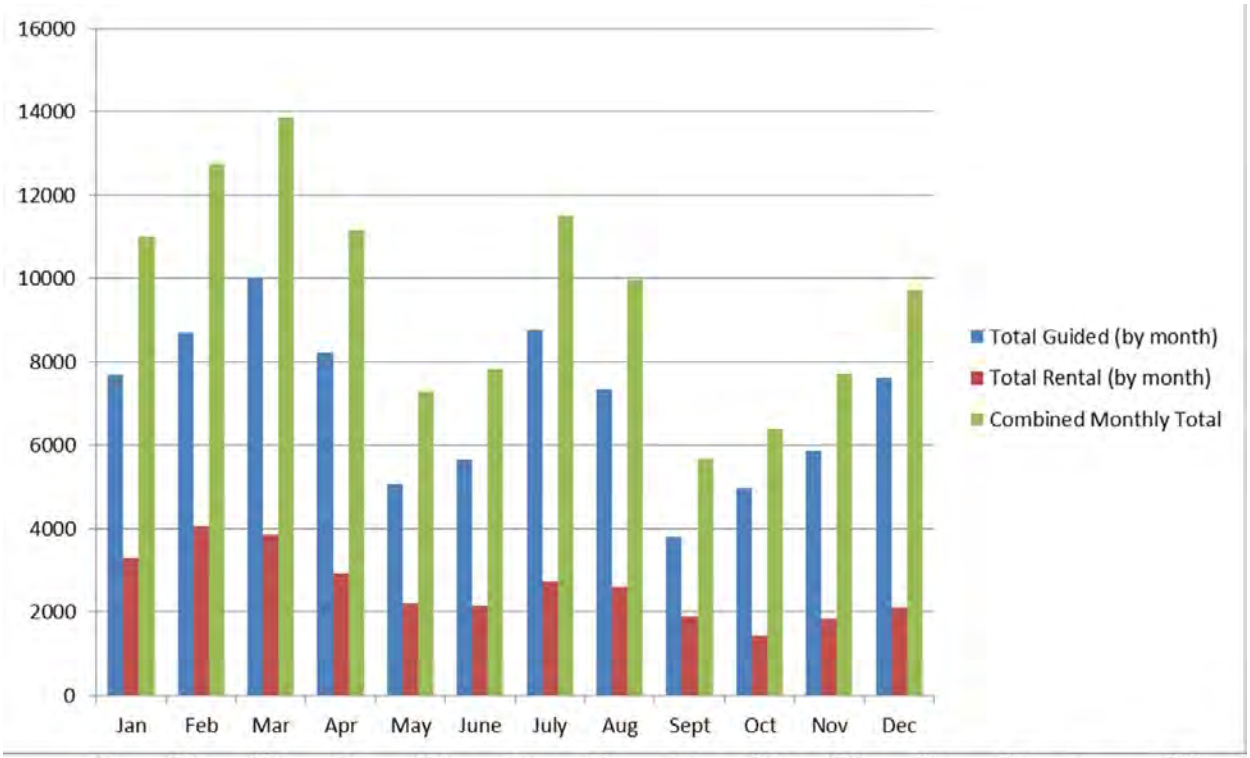


	January	February	March	April	May	June	July	August	September	October	November	December
Total Rental (by month)	1720	2208	2307	3420	2524	2345	2526	2220	1468	1855	1854	1730
Total Guided (by month)	3381	3727	4363	4634	3015	3362	3524	3081	1847	2582	3912	4251
Combined Monthly Total	5101	5935	6670	8054	5539	5707	6050	5301	3315	4437	5766	5981

Visitor Use reported by Commercial Special Use Permit Holders to Crystal River NWR in 2011.

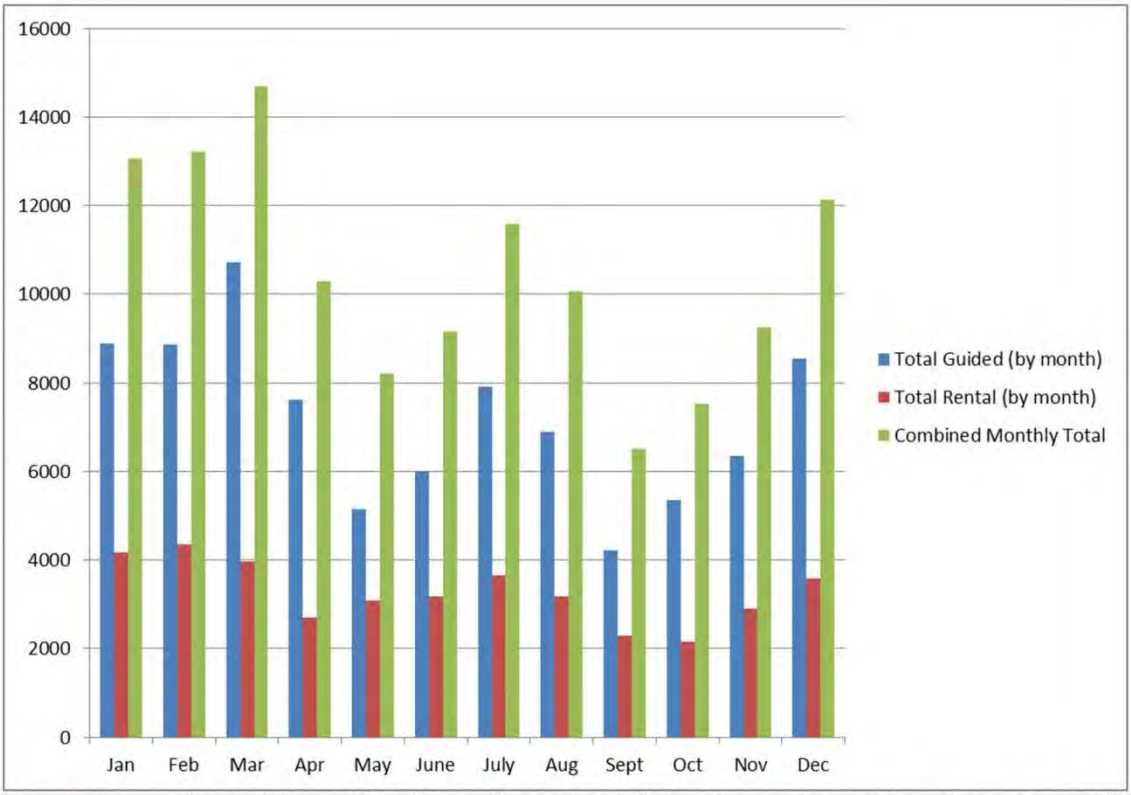
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Guided (by month)	5560	6646	7982	6849	3625	4211	5184	5376	2811	3700	5152	7097
Total Rental (by month)	2517	3181	4000	2709	2213	2216	3455	2370	1345	1038	1676	2184
Combined Monthly Total	8077	9827	11982	9558	5838	6427	8641	7746	4156	4738	6828	9281

Visitor Use reported by Commercial Special Use Permit Holders to Crystal River NWR in 2012.



	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Total Guid	7702	8698	10024	8220	5077	5649	8766	7343	3794	4954	5864	7618	83606
Total Rent	3287	4052	3842	2937	2217	2169	2745	2612	1887	1452	1846	2115	31161
Combined	10989	12750	13866	11157	7294	7818	11511	9955	5681	6406	7710	9733	114767

Visitor Use reported by Commercial Special Use Permit Holders to Crystal River NWR in 2013.



	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Total Guided (by month)	8894	8858	10715	7608	5138	5975	7921	6897	4222	5360	6348	8547	86423
Total Rental (by month)	4169	4346	3974	2688	3073	3172	3653	3177	2283	2160	2906	3581	39182
Combined Monthly Total	13063	13204	14689	10296	8211	9147	11574	10074	6505	7520	9254	12128	125605

Appendix F

Inventory and Monitoring Plan

Inventory and Monitoring Plan for 2014-2015 Manatee Season
at Three Sisters Spring

Methods

Accurate aerial survey observations of manatees within the Three Sisters Spring (TSS) are difficult from the air due to the trees surrounding the springs. Ground observations are needed to determine manatee use within the springs before visitors arrive in order to assess their impact. Although data has been periodically collected on visitors to TSS in the past, additional data will be collected this winter. Ground-based observers and/or cameras will be used to record information on visitors, manatees, and environmental variables. Information will be obtained on weekends and holidays and on select weekdays.

Visitor Information:

- Total number of visitors per day (in-water and on land);
- Number of visitors per hour (in-water and on land);
- Number of visitors (canoe/kayak, private boat, rental boat, and guided tour)
- Average time visitors spend in TSS;
- Number of visitors not wearing wetsuits, fins, masks, and snorkels;
- Number of visitors using flash photography (banned except for SUP holders);
- Number of SUP holders in TSS;
- Number of visitors wading, snorkeling, or standing;
- Number of visitors using noodles; and
- Visitor use in predetermined zones of divided spring run. e.g. conflicts, harassment, crowding.

Manatee Information

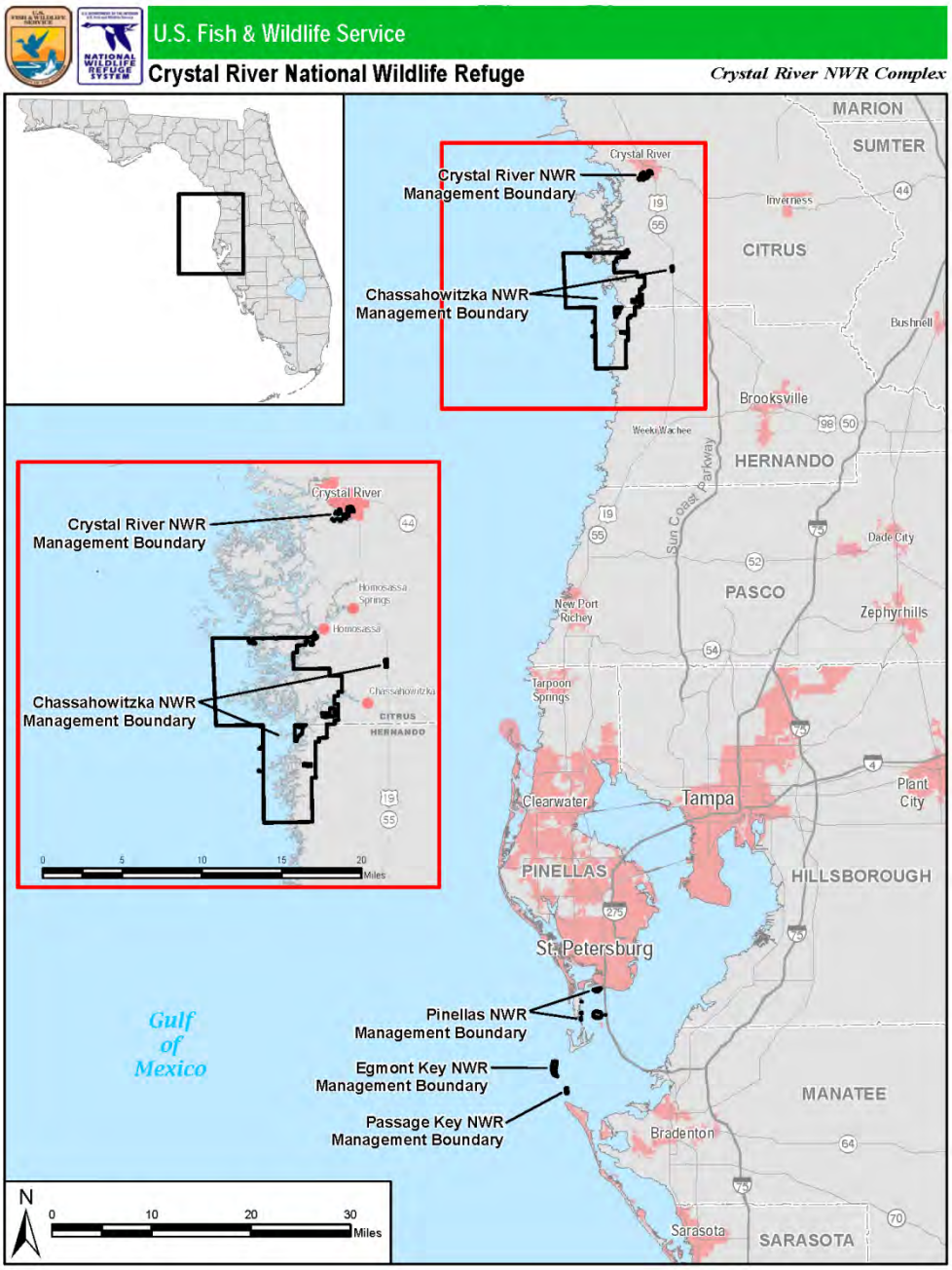
- Number of manatees in TSS prior to visitor entry;
- Manatee location within the spring zones (inside or outside sanctuary);
- Manatee reaction and/or interaction with visitors (remain in spring, change location, engage in interactions with visitor, leave TSS); and
- Manatee behavioral use within zones of TSS.

Environmental Information:

- Date;
- Time;
- Weather conditions (clear, overcast, rain, wind, etc.)
- Tide stage (incoming, outgoing, low or high tide-can be obtained from a tide chart or we may place a tide gauge in the spring run);
- Air temperature collected hourly (current and coldest temperature of the morning);
- Gulf water temperature;
- Noise level (shouting, yelling, splashing, quiet); and
- Turbidity (water quality issues-people or manatees creating poor visibility).

Appendix G

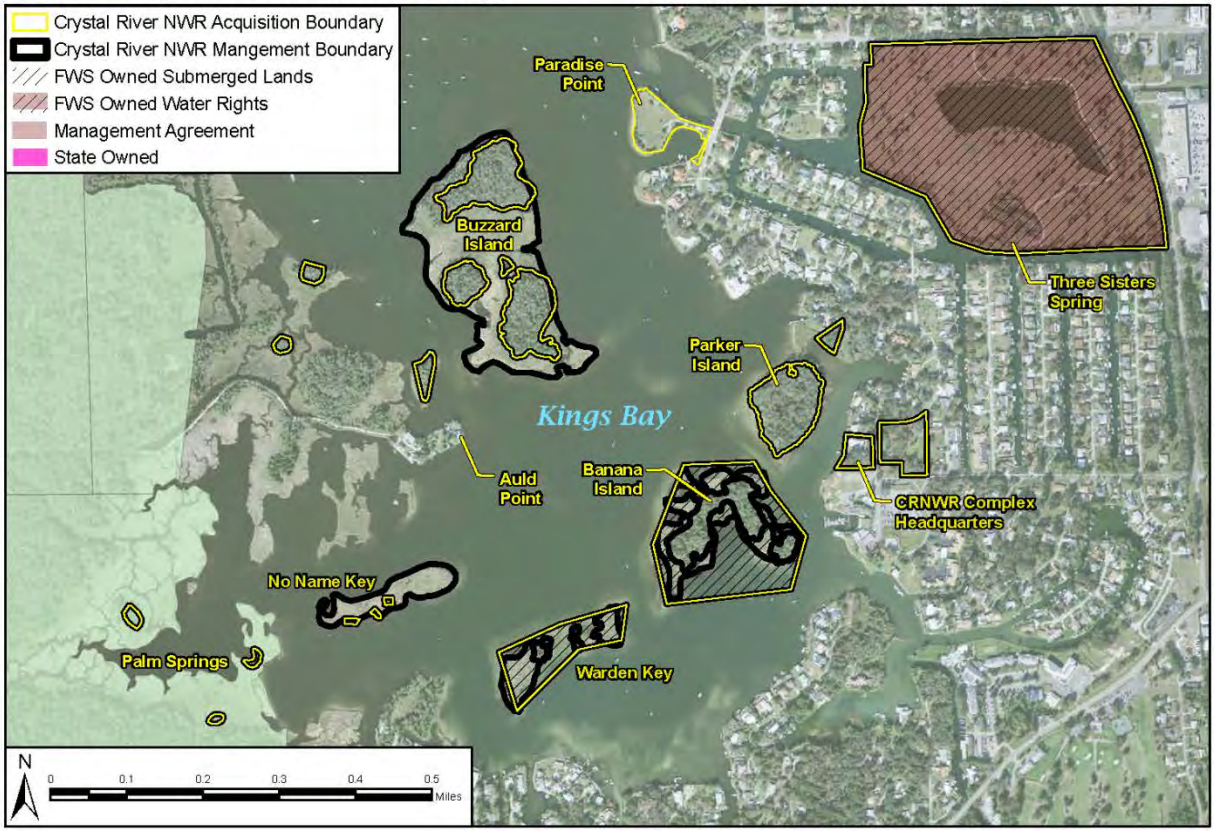
Kings Bay Area Map


U.S. Fish & Wildlife Service
Crystal River National Wildlife Refuge
Crystal River NWR Complex
Crystal River NWR Management Boundary
Chassahowitzka NWR Management Boundary
Pinellas NWR Management Boundary
Egmont Key NWR Management Boundary
Passage Key NWR Management Boundary
Gulf of Mexico
MARION
SUMTER
CITRUS
HERNANDO
PASCO
PINELLAS
HILLSBOROUGH
MANATEE
SARASOTA
Crystal River
Inverness
Bushnell
Brooksville
Weeki Wachee
Sun Coast Parkway
Dade City
Zephyrhills
New Port Richey
Tarpoon Springs
Homosassa Springs
Homosassa
Chassahowitzka
Clearwater
Tampa
Plant City
St. Petersburg
Bradenton
Sarasota
N
0 10 20 30 Miles
0 5 10 15 20 Miles

U.S. Fish & Wildlife Service

Crystal River National Wildlife Refuge

Refuge Land Status - Kings Bay



Appendix H

Increases in Seasonal Manatee Abundance

Within Citrus County, Florida

Aquatic Mammals 2014, *40*(1), 69-80, DOI 10.1578/AM.40.1.2014.69

Increases in Seasonal Manatee (*Trichechus manatus latirostris*) Abundance Within Citrus County, Florida

Joyce M. Kleen[1] and Amber D. Breland[2]

[1]*U.S. Fish and Wildlife Service, Crystal River National Wildlife Refuge, 1502 SE Kings Bay Drive, Crystal River, FL 34429, USA*
E-mail: joyce_kleen@fws.gov
[2]*U.S. Fish and Wildlife Service, North Mississippi National Wildlife Refuges, 2776 Sunset Drive, Grenada, MS 38901, USA*

Abstract

Identified as critical winter manatee habitat, the U.S. Fish and Wildlife Service (USFWS) has documented a significant increase in peak and average Florida manatee (*Trichechus manatus latirostris*) counts during the winter months in Citrus County and Kings Bay, Florida. Manatees use the warm 22º C spring-fed waters of Kings Bay when water temperatures drop below 20º C in the Gulf of Mexico. The USFWS manages winter manatee sanctuaries positioned over and near the bay's warm-water springs. Simple linear regressions of aerial survey data collected between 1983 and 2012 indicate that the peak counts for the survey period were 654 manatees occurring on 5 January 2012 in Citrus County and 566 manatees occurring on 13 January 2010 in Kings Bay. The average winter count has increased from 102 ± 5 (1983) to 216 ± 49 (2012) in Citrus County and from 73 ± 6 (1983) to 148 ± 41 (2012) in Kings Bay. Summer surveys were conducted consistently between 2004 and 2012. No significant change in peak or average manatee abundance was detected during this period. The increase in winter manatee counts prompted the need to review existing manatee protection measures, including manatee use within the sanctuaries. Additional analysis of habitat quality (i.e., salinity, plant community, disturbance caused by human recreation) on the abundance and distribution of manatees in the bay is needed to promote adaptive manatee management in the bay.

Key Words: Sirenian, Kings Bay, Citrus County, springs, aerial surveys, Florida manatee, *Trichechus manatus latirostris*

Introduction

West Indian manatees (*Trichechus manatus*) range from Brazil north to Mexico and the southeastern United States, including the Caribbean Islands. This species includes two subspecies: the Antillean (*T. M. manatus*) and the Florida (*T. M. latirostris*) manatee. The Florida manatee is found in the southeastern United States, with the core of its range in Florida (U.S. Fish and Wildlife Service [USFWS], 2011). Throughout the year, Florida manatees utilize a variety of habitats, including rivers, estuaries, and coastal areas. Although freshwater is preferred, manatees frequently use salt and brackish waters for travel and feeding (Husar, 1978; Hartman, 1979; Powell & Rathbun, 1984).

Florida manatees are sensitive to cold water temperatures and move to warm-water sites when the water temperature drops below 20º C (Reynolds & Odell, 1991). When exposed to cold water for extended periods of time, manatees are susceptible to death from cold stress (Buergelt et al., 1984; Bossart et al., 2002). Warm-water discharges from man-made power plants and factories provide artificial refugia; however, natural refugia are most commonly provided by warm-water springs (Husar, 1978; Hartman, 1979; Laist & Reynolds, 2005).

Even though the temperature of inshore waters of the Gulf of Mexico can fluctuate frequently throughout the winter months (Hartman, 1979), the temperatures of warm-water springs remain constant at 22º C (Scott et al., 2004). While many manatees may overwinter within particular warm-water refugia, some individuals move to and from foraging sites during warm spells throughout the winter (King, 2002). Citrus County, specifically Kings Bay and the Crystal and Homosassa Rivers, are the principal warm-water refugia for manatees on the central west coast of Florida (Hartman, 1974; Powell & Rathbun, 1984; Rathbun et al., 1990).

Manatee numbers increase in Citrus County waters during the winter months (October through March for this analysis). Manatees return to the same wintering sites year after year, displaying strong patterns of site fidelity to individual refugia

or regional networks of refugia (Reid et al., 1991; Rathbun et al., 1995; Langtimm et al., 2004). Almost 90% of those manatees that have been identified by scar patterns in the Crystal River area return each winter (Powell & Rathbun, 1984; Reid et al., 1991; Langtimm et al., 2004).

Historically, the manatee's winter range was Charlotte Harbor on the Gulf coast and Sebastian Inlet on the Atlantic coast (Moore, 1951). This more southern winter range was prior to the construction of power plants, which serve as artificial warm-water sites (Reynolds & Wilcox, 1994; Laist & Reynolds, 2005). Now manatees are using wintering sites even further north, with hundreds of manatees wintering in natural springs in Crystal River and a few dozen manatees wintering at Wakulla Springs (Butler et al., 2011).

During the summer months (April through September for this analysis), manatee movements are not limited by water temperatures (Rathbun et al., 1990; Langtimm et al., 2011). When the waters of the Gulf of Mexico warm, manatees disperse from thermal sites like Kings Bay, but late cold fronts can draw many manatees back into the warm springs. As food resources are depleted in and around thermal sites, dispersing manatees travel along the Gulf coast in search of aquatic vegetation to regain weight lost during the winter months. Manatees have been documented moving from Kings Bay north to the Suwannee River and to a lesser degree southward to Tampa Bay during the spring, returning to Kings Bay in the fall and winter months (Rathbun et al., 1990).

West Indian manatees, including both subspecies, were listed as an endangered species in 1967 under the Endangered Species Preservation Act (PL 89-669). The Florida manatee and its habitat are currently protected under the Endangered Species Act, as amended (ESA; Title 16 U.S. Code, Sections 1531-1544); the U.S. Marine Mammal Protection Act of 1972, as amended (MMPA; Title 16 U.S. Code, Section 1361); and the Florida Manatee Sanctuary Act (CH 370.12(2), F.S.). Under the Endangered Species Act, a Florida Manatee Recovery Plan was developed and implemented with measures which focus on expanding our knowledge of the species through sound science in order to make informed, meaningful management decisions. A Citrus County Manatee Protection Plan was developed to reinforce and assist in the implementation of the Florida Manatee Recovery Plan (Citrus County Department of Development Services [CCDDS], 1998).

As part of the efforts to recover the Florida manatee, the Crystal River National Wildlife Refuge (NWR) was established for the protection of the Florida manatee in 1983. Seven seasonal federal manatee sanctuaries are managed under the refuge, which protect 16.2 ha of thermal refugia and foraging habitat (Figure 1). These sanctuaries were created between 1980 and 1998 and are set aside for manatees, with no human activities, such as swimming, snorkeling, diving, boating, or fishing, permitted. Manatees in the bay are protected with a variety of boating speed zones (idle and slow speed), some of which are implemented only during the winter months and others which are effective throughout the year.

Additional manatee protections were added in 2012 when a federal manatee refuge designation was approved for Kings Bay to help prevent manatee deaths from boat strikes (USFWS, 2012), one of the leading causes of manatee mortality (Florida Fish and Wildlife Conservation Commission [FWC], 2012). The new manatee refuge rules clearly list 12 prohibited activities which further defined appropriate human–manatee interactions, reduced the size of the bay's summer 30 mph water sports zone, and reduced the number of days this increased speed limit is in effect (White & Barrett, pers. comm., 2012).

To fulfill endangered species management and recovery goals, two primary objectives were identified by USFWS (2001). The first called for an increase in the total population of the West Indian manatee, with a corresponding reduction in threats to the species. The second objective called for the establishment of optimum sustainable populations in natural habitats throughout the manatee's historic range in the United States. Aerial manatee surveys were initially designed to provide data on the distribution and abundance of Florida manatees along the northern Gulf coast of peninsular Florida to measure the success of these two population objectives.

The USFWS has continued these aerial surveys to fulfill the management needs of Crystal River NWR under the guidelines of the Florida Manatee Recovery Plan. Tasks within the plan include (1) to continue and improve aerial survey techniques and analyze data to evaluate fecundity and determine distribution patterns; (2) to establish and evaluate manatee management programs at protected areas; and (3) to maintain, improve, and develop tools to monitor and evaluate manatee habitat.

Manatee survey data are maintained by USFWS; however, they have been used by other groups, including nonprofit conservation organizations, local governments, and state agencies. Distribution and count data have been used to establish the seven federal manatee sanctuaries within Kings Bay and to implement state boating speed zones. Data have also been used by both state and federal agencies, and conservation groups when commenting on proposed docks and marinas.

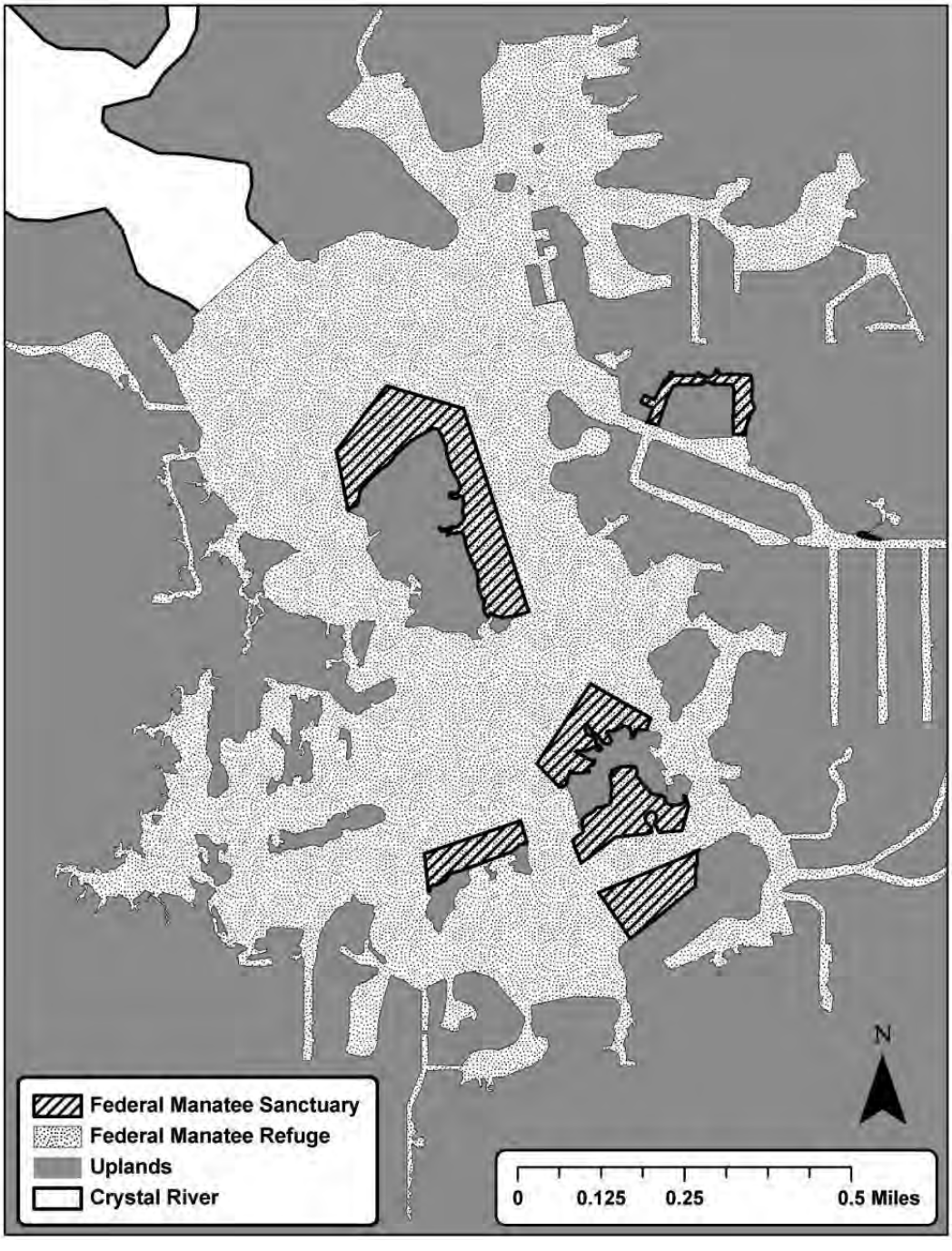


Figure 1. U.S. Fish and Wildlife Service (USFWS) manatee protection areas in Kings Bay, Citrus County, Florida

While the data have been useful in this capacity, results from these surveys have not been formally analyzed and made readily accessible to the general public and the scientific community since 1994 (Ackerman, 1995). The analysis of this long-term dataset will fill a significant gap in the understanding of manatee use of Citrus County and, more specifically, Kings Bay, Florida. In a time of

changing climate, increasing public use and ecotourism, and evolving manatee protections, survey data can facilitate discussion and development of protections for this endangered species.

Methods

Study Area

Located along the west coast of peninsular Florida approximately 104 km north of Tampa, Citrus County is characterized by several spring-fed rivers and creeks, freshwater bays, and brackish and saltwater marshes. Listed in order from northernmost extent south, the primary bodies of water surveyed include the Cross Florida Barge Canal, Crystal River nuclear power plant discharge canal, Crystal River, Kings Bay, Salt River, Homosassa River, and Chassahowitzka River. The coastal bays and waterways connecting these areas are also included in the survey. Winter warm-water refugia where manatees concentrate can be found at Duke Energy's Crystal River nuclear power plant discharge canal and the headsprings of the Homosassa River and Kings Bay (Hartman, 1979).

Kings Bay is located within the city of Crystal River, Citrus County, Florida, and forms the headwaters of the Crystal River, which flows 11 km to the Gulf of Mexico and provides bay access for manatees (Hartman, 1979). The bay is approximately 243 ha (Jones et al., 1998) and is fed by at least 70 warm-water springs (Rosenau et al., 1977; Flannery & Dewitt, 2009). The abundance of springs combined with high manatee use makes it the largest known natural thermal refuge for West Indian manatees (Hartman, 1979; Buckingham et al., 1999).

Aerial Surveys

Surveys were flown weekly or biweekly yearround using a Cessna 172 at an altitude of 304 m, traveling at 80 kts. Surveys were initiated between 0900 and 1100 h and averaged 1.7 h during the winter and 2 h in the summer, depending on the density of manatees present and the survey conditions. Variable survey start times are attributed to a minor change in the survey protocol in the 1980s and unfavorable survey conditions (e.g., ground fog, low cloud ceiling, etc.).

An experienced observer seated in the right-front seat of the aircraft plotted manatee locations on gridded maps with the density of animals at each location. The observer differentiated between calves and adult manatees when recording location data; calves were defined as approximately half the size or less of an adult in close proximity. The plane circled each area until the number of manatees counted remained constant or decreased. This methodology yielded a minimum count for the area (Packard et al., 1985). Where high densities of manatees occurred, photographs were taken, and later enlarged and viewed with the aid of a backlit table to verify the count.

The same flight path was flown on every survey, with minor deviations due to winds moving the plane off course. A variety of observers were used from 1983 through 1990. The same observer completed almost all of the surveys between 1990 and 2012. The same alternate observer was used during the entire survey period (1983 to 2012).

Additional data recorded during the surveys included date, survey start and end times, pilot and observer names, wind direction and velocity, percent cloud cover, air temperature, Gulf water temperature, tide height, and water clarity. Protocols for the survey conditions were limited to winds less than 17 kts/h, no precipitation, and no ground fog or cloud ceilings below 152 m.

Data Analysis

Winter survey data were collected between 1 October and 31 March from 1983 through 2012. These survey data could be compared since the survey protocol and frequency were consistent throughout the 29-y survey period. Average manatee counts were calculated for each winter season, and the peak count for each season was used to compare maximum observed counts across time. A simple linear regression was used to test the alternate hypothesis that maximum observed and average seasonal manatee counts have increased with time (y = number of manatees; x = time). All tests were considered significant where $p < 0.05$. This was done for both Citrus County and Kings Bay.

Analysis of summer survey data, 1 April to 30 September, was limited due to changes in the frequency of surveys. Although counts by refuge staff have been completed to document manatee use of the survey area since 1983, the frequency of summer surveys was neither standardized nor sufficient to allow for analysis until 2004. Therefore, summer survey data were analyzed only for 2004 through 2011. Data were analyzed using the methods described for winter manatee data analysis.

Survey conditions were also examined using descriptive statistics. A simple linear regression was used to assess the change in Gulf water temperatures and water clarity within the bay and the county. An analysis of water temperatures was only completed for the winter season because water temperature is not a limiting factor for manatees during the summer months. Water clarity data were analyzed for the entire survey period, with no distinction between survey seasons.

Results

Winter Manatee Counts

Citrus County—Winter manatee counts in Citrus County increased significantly between 1983 and 2012, with significant increases in both average and peak observed manatee counts (Average: t_{29} = 9.32, r^2 = 0.76, β = 0.86, $p < 0.001$; Peak observed: t_{29} = 12.12, r^2 = 0.84, β = 14.72, $p < 0.001$). Winter use was variable. Extremes observed during the survey period included a minimum of 12 and a peak observed count of 654, with an average of 190 ± 5 manatees (Figure 2a).

Kings Bay—Manatee counts within Kings Bay during the winter months were similar to that of Citrus County. Increases in average counts and peak observed use were both significant (Average: t_{29} = 6.46, r^2 = 0.61, β = 3.61, $p < 0.001$; Peak observed: t_{29} = 6.57, r^2 0.63, β = 10.41, $p < 0.001$). When surveys began in November 1983, peak observed manatee events involved an addition of approximately 50 manatees during extreme cold temperatures. Recent peak events are of a greater magnitude, with peak observed usage involving an influx of more than 100 manatees in addition to the average winter population. The average

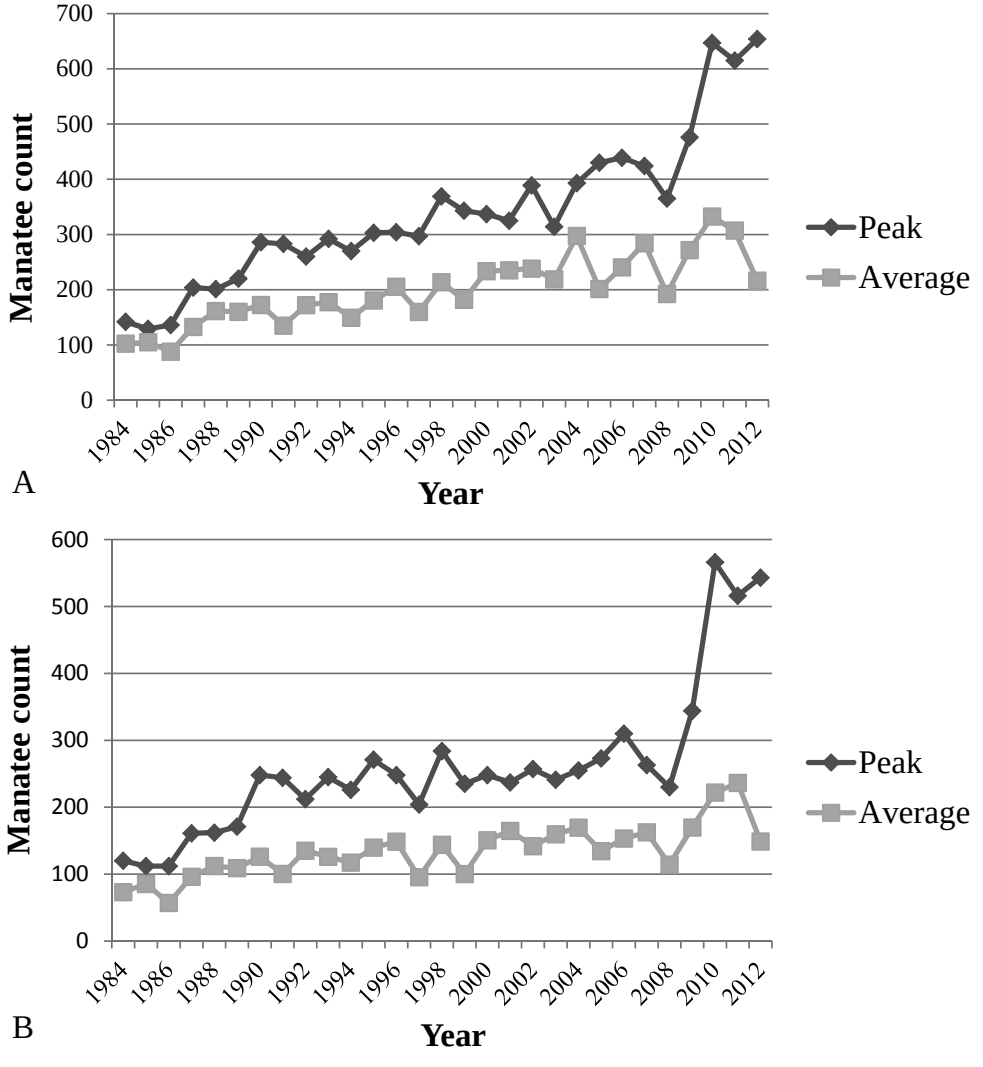


Figure 2. Peak and average manatee counts in winter from 1983 through 2012 in (A) Citrus County and (B) Kings Bay, Florida

annual count of manatees in winter was 129 ± 4, ranging from 5 to 566 animals (Figure 2b).

Summer Manatee Counts

Citrus County—Citrus County experienced no significant change in manatee counts during the summer months (Average: t_9 = -1.16, r^2 = 0.16, β = -1.44, p = 0.28; Peak observed: t_9 = -0.86, r^2 = 0.095, β = -2.50, p = 0.42). The average number of manatees observed throughout the 8 y of the survey was 61 ± 3 (Figure 3a). Observed manatee counts reached a peak of 188 and a minimum of 18 animals in the county.

Kings Bay—As with Citrus County, neither average nor peak observed manatee counts significantly increased in Kings Bay from 2004 to 2011 (Average: t_9 = -1.40, r^2 = 0.22, β = -1.34, p = 0.20; Peak observed: t_9 = -0.73, r^2 = 0.072, β = -0.52, p = 0.49). The annual peak number of manatees observed in Kings Bay during summer survey seasons averaged 75 ± 7 (Figure 3b). An average of 34 ± 2 manatees was observed within the 9 y of surveys, while as few as 11 and as many

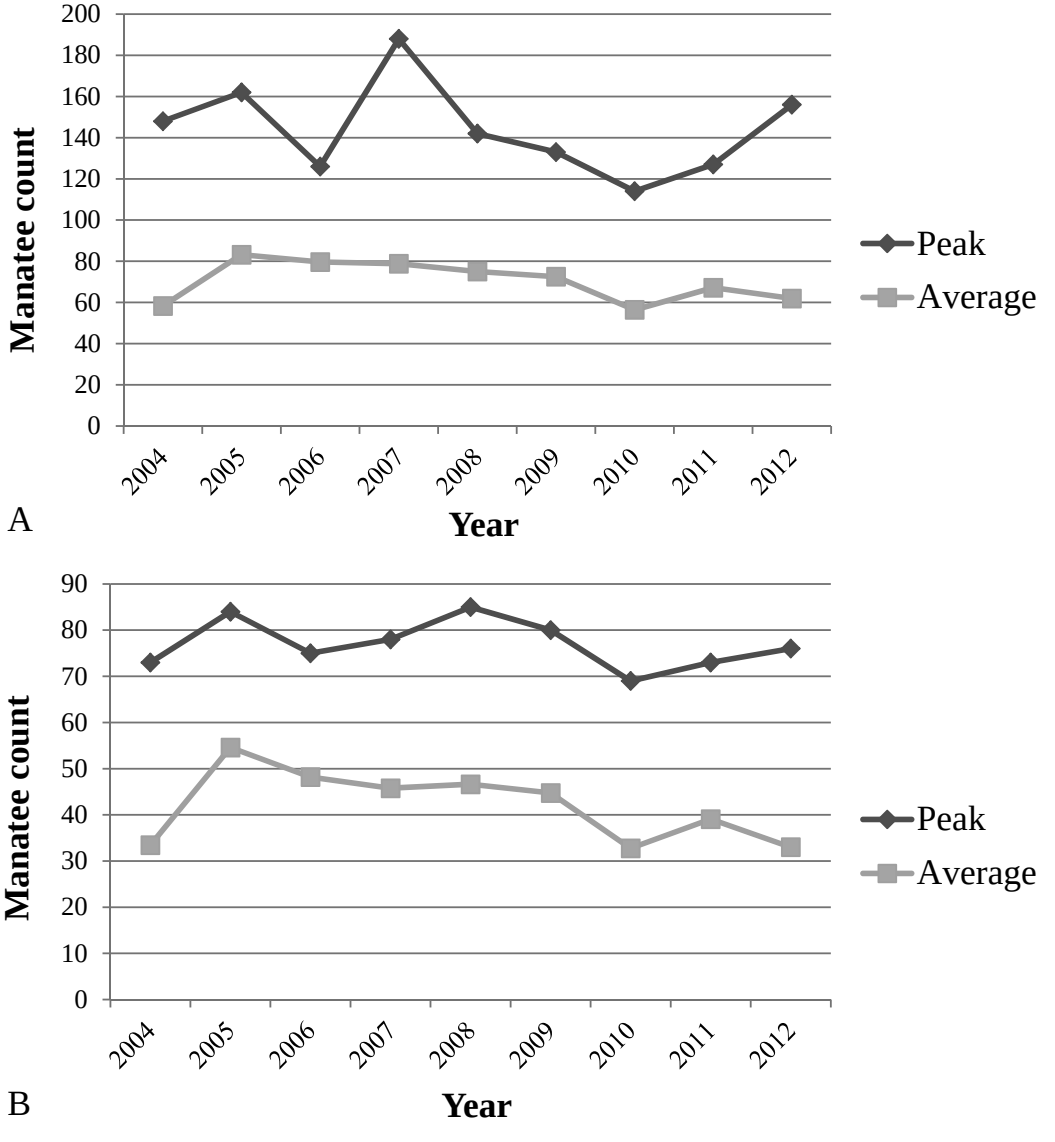


Figure 3. Peak and average manatee counts in summer from 2004 through 2012 in (A) Citrus County and (B) Kings Bay, Florida

as 85 manatees were recorded during the individual surveys.

Survey Conditions

Gulf of Mexico Water Temperatures—The annual minimum Gulf water temperature during the winter season has significantly decreased since surveys began in 1983 (t_{21} = -0.32, r^2 = 0.48, β = -0.17, p = 0.029). The minimum winter Gulf water temperature was 13° C in 1991 and 9° C in 2011, with a 29-y average of 13.3° C ± 0.48. The average Gulf water temperature within the winter season has not significantly changed over the 29 y of surveying (t_{21} = -0.11, r^2 = 0.088, β = -0.017, p = 0.70). The average winter water temperature in the Gulf was 19.06° C ± 0.20.

Water Clarity—Water clarity has not significantly changed over the 29-y survey period (t_{28} = -0.62, r^2 = 0.12, β = -0.081, p = 0.54). Average water clarity, ranked on a scale of 1 (poor) to 5 (excellent) in the survey protocol, was 2.38 ± 0.10 (fair to good) over the 29 y of surveying.

Discussion

Over a period of 29 y, Citrus County and Kings Bay, Florida, have experienced a continuous increase in manatee use during the winter months. Manatee sightings in the Crystal River area along the Gulf coast of Florida were documented as rare in the 1940s and earlier, prior to the establishment of federal manatee sanctuaries (Moore, 1951; Ackerman, 1995). Beginning in the 1960s, increases in the Crystal River population were documented by Hartman (1979), Powell & Rathbun (1984), O'Shea (1988), and Rathbun et al. (1990). Although there was a noted increase in the Crystal River manatee population throughout the 1960s (Hartman, 1974), the first aerial surveys to document manatees in this area began in 1967. Hartman (1979) identified a total of 63 different manatees in Kings Bay using scar patterns and a maximum of 38 manatees during the first season of aerial surveys in the winter of 1967-1968 (Hartman, 1974). By 1980, the wintering manatee population in the Kings Bay area increased to 99 animals (Powell & Rathbun, 1984); and in the winter of 2011-2012, similar aerial surveys documented 546 individual manatees within the bay.

Since 1967, except for three winter seasons from 1969 to 1971, aerial surveys have been conducted in the coastal waters of Citrus County, Florida, to determine the distribution and abundance of endangered Florida manatees (Powell, 1981; Kochman et al., 1985; Packard et al., 1986). USFWS began conducting aerial surveys in 1976; however, the protocol for data collection was not standardized until 1983 when Crystal River NWR was established for the protection of the Florida manatee. The continued monitoring of manatee distribution and abundance within the survey area is recommended by the USFWS Manatee Recovery Plan, which also details the required survey protocol (USFWS, 1990, unpub. report; USFWS, 2001).

Irvine & Campbell (1978), Shane (1981), Kinnaird (1985), and Packard et al. (1985) agreed that aerial surveys are considered to be the most accurate method of counting manatees, although some manatees are undoubtedly missed (Rathbun, 1988; Langtimm et al., 2011). Marsh & Sinclair (1989) documented two types of visibility bias: (1) perception bias (proportion of the target species present and visible in the survey area but not observed) and (2) availability bias (proportion of the target species present but not visible; Lefebvre et al., 1995). Another possible source of bias is that larger groups may have a higher probability of detection than smaller groups or individuals (Langtimm et al., 2011). Visibility may be reduced by a variety of factors, including deep and/or turbid water, ripples on the surface of the water, cloud cover which reduces the sun's penetration into the water, or full sun which can cause glare on the water's surface.

As USFWS has limited aerial survey data predating the current manatee protections (speed zones and sanctuaries), we assume that the continued increase in the Citrus County and Kings Bay population has paralleled the increase in manatee protections in the area. Protective provisions within the bay were initiated in 1980 with the establishment of the first three federal manatee sanctuaries within Kings Bay. Three years later, Crystal River NWR was established to provide habitat protection and staffing for the recovery of the Florida manatee population. Since then, local manatee protections have grown to include speed zones, winter manatee sanctuaries, and a special federal designation of a Kings Bay Manatee Refuge (50 C.F.R. 17.104) (USFWS, 2012).

Powell & Rathbun (1984) and Rathbun et al. (1990) suggest the increase in the Citrus County manatee population may have been a combination of local recruitment and immigration from areas further south. High levels of local recruitment are supported by population modeling (Langtimm et al., 2004). The northwest Florida population of Florida manatees, which includes Citrus County, has a higher growth rate than other parts of the species' range (Langtimm et al., 2004). This higher rate has been attributed to lower human impacts than in heavily developed areas in the southern parts of the state and Atlantic coast; manatee use of warm-water springs for overwintering sites; and the strong management efforts to protect the

manatee in this region (Langtimm et al., 2004). With higher reproduction and survival rates, an increase in manatee use of Kings Bay would again suggest that these provisions are creating a safer, higher quality habitat for manatees during the winter months.

Other factors which must be considered include habitat conditions outside of Kings Bay. This would primarily be the change in water temperatures in the Gulf of Mexico. Average Gulf water temperatures have not significantly decreased. With an average temperature of 19.06° C ± 0.20, it has remained cold enough during the winter seasons to move manatees into warm-water habitats. A notable relationship is the increase in peak observed manatee events occurring during the winter months. These might be related to the minimum Gulf water temperatures, which have significantly decreased from 13° C in 1991 to 9° C in 2011.

Hartman (1979) noted that even within the spring-fed waters of the bay, temperatures could vary by as much as 7° C between the King Spring (23.7° C) and the head of Crystal River and, on cold mornings, differences between the surface and bottom waters in the spring run could be as high as 5° C. If this still holds true, the importance of warm-water habitat would be increased today as temperatures can be significantly colder than at the time of that study. Hartman (1979) hypothesized that the surfacing and submerging of manatees had the potential to mix these cooler and warmer waters when several animals were present. If this was occurring it could have a significant effect on water temperature on days with extreme low temperatures as the sanctuaries and springs currently attract several hundred manatees at times.

Although the use of Kings Bay is largely attributable to warm-water springs, manatees were regularly observed in low densities in other county waters throughout the year. Manatee counts within Kings Bay have been shown to be proportional to the air temperature and, as the Gulf of Mexico's waters warm, manatees leave aggregation sites around springs and move to surrounding waters such as the Crystal and Salt Rivers in search of food and other resources not abundant within Kings Bay (Hartman, 1979; Kochman et al., 1985; Rathbun et al., 1990; King, 2002).

Quality foraging sites are found extensively along the coast of Citrus County, Florida. Hartman (1979) noted the Crystal River area's abundant food supplies may have resulted in a higher immigration rate compared to other winter sites, especially with the introduction of exotic vegetation in the mid-1960s. This is especially important because even with some of the sanctuaries providing protected foraging habitat within Kings Bay, food resources are noticeably depleted as the winter progresses and the density of manatees increases within the bay. Eventually, with the decline of exotic vegetation in Kings Bay, individuals initially attracted to the site for those food resources may remain due to site fidelity, loss of other quality wintering habitat, or more extreme winter temperatures.

Manatees have been frequently observed feeding in the waters adjacent to the salt marshes of the county. These marshes are very heterogeneous and include shallow coves, small lagoons, and tidal creeks (Hartman, 1979). Such areas provide important habitat for manatees throughout the year. Once the Gulf water temperature is high and stable enough to allow manatees to leave the bay for the summer, they disperse along the coast to utilize the rich food resources available. Without the restriction of cold water temperatures, manatees can travel long distances to forage during the summer. This migration away from thermal sites for food resources explains low summer counts. Although submerged aquatic vegetation is available within the coastal waters of Citrus County, manatees are not limited by water temperatures and, therefore, can travel to other areas of high-quality forage. Peak usage in Kings Bay during the summer months is typically due to late cold fronts, which can bring an influx of manatees returning to the springs during late spring and early summer.

Within Kings Bay and the Crystal River, food resources have likely experienced shifts in their abundance, variety, and distribution over the past 30 y. Salinity can significantly affect the plant community as some species of submerged aquatic vegetation are less salt tolerant than others (Hoyer et al., 2001; Frazer et al., 2006). An increase of salinity by two or three practical salinity units (psu) has been suggested as a threshold for causing significant reductions in plant biomass within Kings Bay (Hoyer et al., 2001). Frazer et al. (2001) documented bottom salinities ranging from 0.74 to 15.36 psu within 1 y of monitoring in Kings Bay, with a mean salinity of 2.1 psu. These levels suggest a long-term increase in salinity within the bay. Significant declines in total plant biomass could have resulted from such a shift (Frazer et al., 2001, 2006).

With increases in salinity in Kings Bay, gradual changes in the vegetation from fresh water tolerant plants (exotics like *Hydrilla verticillata*) to salt tolerant plants (exotic *Myriophyllum spicatum*) is also occurring (Frazer et al., 2001, 2006). This change in vegetation may be affecting the distribution and abundance of manatees within Kings Bay and Citrus County. Changes within the bay

could decrease the value of sanctuaries established within the last 30 y to provide food resources. A combination of record high manatee use and reduced vegetation could result in increased stress to wintering manatees that would force them to leave the safety of warm-water habitat to seek food resources in local rivers and the Gulf or remain in the springs at the risk of illness from lack of food. If total vegetation biomass does decline in Kings Bay, Crystal River, and other habitats within Citrus County, more manatees may disperse from the county during the summer months when they are not limited by cold temperatures. The effects of continued sea level rise on manatees and the continued increase in the salinity of Kings Bay and the associated coastal waters of Citrus County will need to be closely monitored.

We propose that increased manatee survival and population growth and increasingly severe winter events have led to the high winter manatee abundance in Kings Bay. Population growth has been observed to be at a higher rate in an area which includes Citrus County and Kings Bay as compared to other parts of the Florida manatee's range (Eberhardt & O'Shea, 1995; O'Shea & Ackerman, 1995; Runge et al., 2007a). While the numbers of manatees that utilize the resources of the bay continue to increase, they must not only compete with higher densities of manatees, but with increasing numbers of visitors and boaters as well. Even in the 1960s and 1970s, Hartman (1979) noticed the rarity of seeing a manatee free of propeller scarring in Citrus County and attributed a significant amount of manatee harassment to boats and divers, both of which have been shown to negatively influence manatees and increase their use of sanctuaries (Buckingham et al., 1999; King, 2002; King & Heinen, 2004). As the number of manatees continues to increase, so does the ecotourism demand within Kings Bay. Visitation to Crystal River NWR has increased from 100,000 people in 2004 to 150,000 in 2011 (I. Vicente, pers. comm., 2012).

Kings Bay and its associated waters are internationally recognized and continue to experience an increase in visitors for their unique value to ecotourism, which attracts snorkelers, scuba divers, paddlers, pleasure-boaters, photographers, and videographers (Buckingham et al., 1999). In 2011, dive shops reported guiding or renting equipment for watching and swimming with manatees to 93,099 tourists. Fifty-four percent of those visitors came during the winter manatee season (I. Vicente, pers. comm., 2012). Additionally, residents and tourists bring their personal watercraft to recreate in the bay throughout the year.

Warm-water springs appear to be the best natural winter habitat for Florida manatees in the northern two-thirds of Florida (Laist & Reynolds, 2005). With the importance of springs for wintering manatees strongly supported by the literature (Hartman, 1979; King, 2002; King & Heinen, 2004; Laist & Reynolds, 2005) and increasing demands on these natural resources, protection is critical. Laist & Reynolds (2005) identified only four warm-water springs with winter congregations of 50 or more manatees in Florida, many of which face reduced flow rates from increased demands on groundwater. Two of these four springs were in Citrus County, including the Kings Bay/Crystal River spring complex and the Homosassa Springs complex. Statewide survey data suggest that the population supported within Citrus County and the rest of the Big Bend coast (Dixie, Levy, Citrus, and Hernando Counties) may represent a significant proportion of the Florida manatee's population (Powell & Rathbun, 1984; Kochman et al., 1985; Ackerman, 1995).

A "core biological model" was developed by Runge et al. (2007a) to describe Florida manatee life history and predict future population dynamics using the best data currently available. The probability of extinction in the core biological model assessed the role of five threats to manatees: (1) watercraft-related mortality, (2) loss of warm-water habitat in winter, (3) mortality in water-control structures, (4) entanglement, and (5) red tide (Runge et al., 2007b). Watercraft-related mortalities were identified as having the greatest impact on manatee populations in Florida (Runge et al., 2007a). Runge and colleagues' (2007a) model predicted that the northwest region's population, which includes Citrus County, will increase over time until manatee carrying capacity in warm water is reached and then growth will slowly decline. A long-term population decline is predicted for the other regions.

The USFWS currently protects seven manatee sanctuaries, enforces idle and slow boating speed zones, and enforces the Kings Bay Manatee Refuge. The continuation of aerial manatee surveys within the survey area will be critical in monitoring the effectiveness of the new federal manatee refuge in Kings Bay. This unique federal designation is separate from the national wildlife refuge designation. Unlike a national wildlife refuge, the manatee refuge provides added protection for manatees not through the physical acquisition of habitat but by the designation of the public waters of Kings Bay as a manatee refuge, which are subject to more rigorous regulations for human–manatee interaction. These special regulations help clarify what constitutes harassment of this endangered species for swimmers, paddlers, and watercraft operators.

Further analysis of the existing data is needed to evaluate the current use of the seven sanctuaries. While the data have been internally analyzed and used in the creation of the new Kings Bay Manatee Refuge, the spatial distribution of wintering manatees within the bay should be examined to assess the effectiveness of the current sanctuary sizes and locations. Some sanctuaries may need to be relocated, such as Warden Key, as the distribution of resources utilized by manatees has changed. Evaluating the reason behind any shift in distribution of manatees from older sanctuaries (Warden Key) to newer sanctuaries (Three Sisters Springs) is also needed. For example, this shift may be due to an increase in salinity in Kings Bay and a movement of manatees to fresher waters or higher quality food resources.

Identified as critical winter manatee habitat, USFWS surveys have documented a significant increase in manatee use during the winter months in Kings Bay, Florida. We recommend a more detailed analysis of aerial manatee survey data, including the effects of altered habitat (i.e., salinity, plant community, and protected areas) and human recreation (i.e., boating, swimming, etc.) on the abundance and distribution of manatees in the bay to guide the recovery and conservation of this endangered species.

Acknowledgments

We thank the Friends of Crystal River NWR Complex, Inc. and all of their donors for providing financial support for aerial manatee surveys. Crystal Aero Group Inc. provided piloting for all flights from the Crystal River Airport and has graciously adjusted their schedule on numerous occasions to accommodate our changing flight needs. We thank B. Quarles for completing several aerial manatee surveys used in this analysis and P. Carrier-Moisan, G. Jameson, S. Hensley, A. Asai, J. Hall, K. Wayes, B. Weiss, O. Bailey, and S. Hook for assisting in the entering and revision of data. Finally, we thank B. Bonde and three anonymous reviewers for their comments on this manuscript.

Literature Cited

Ackerman, B. B. (1995). Aerial surveys of manatees: A summary and progress report. In T. J. O'Shea, B. B. Ackerman, & H. F. Percival (Eds.), *Population biology of the Florida manatee* (Information and Technology Report 1, pp. 13-33). Washington, DC: U.S. Department of the Interior, National Biological Service. 289 pp.

Bossart, G. D., Meisner, R. A., Rommel, S. A., Ghim, S-J., & Jenson, A. B. (2002). Pathological features of the Florida manatee cold stress syndrome [Electronic version]. *Aquatic Mammals*, *29*(1), 9-17. http://dx.doi.org/10.1578/016754203101024031

Buckingham, C. A., Lefebvre, L. W., Schaefer, J. M., & Kochman, H. I. (1999). Manatee response to boating activity in a thermal refuge [Electronic version]. *Wildlife Society Bulletin*, *27*, 514-522.

Butler, S., Wilbur, P., Meigs-Friend, G., & Reid, J. P. (2011). Documented increase in manatee use in the Wakulla River, FL. *Proceedings of the19th Biennial Conference on the Biology of Marine Mammals*, Tampa, FL.

Citrus County Department of Development Services (CCDDS). (1998). Manatee protection element. In *Citrus County comprehensive plan 1995-2020* (Chapter 13). Lecanto, FL: CCDDS.

Eberhardt, L. L., & O'Shea, T. J. (1995). Integration of manatee life history data and population modeling. In T. J. O'Shea, B. B. Ackerman, & H. F. Percival (Eds.), *Population biology of the Florida manatee* (Information and Technology Report 1, pp. 269-279). Washington, DC: U.S. Department of the Interior, National Biological Service. 289 pp.

Endangered Species Preservation Act of 1966 (PL 89-669).

Endangered Species Act of 1973, as amended (ESA) (Title 16 U.S. Code, Sections 1531-1544).

Flannery, M., & Dewitt, D. (2009). *An inventory of spring vents in Kings Bay, Crystal River, Florida.* Brooksville: Vanasse Hangen Brustlin, Inc., Southwest Florida Water Management District.

Florida Fish and Wildlife Conservation Commission (FWC). (2012). *Florida manatee program*. Retrieved 15 January 2014 from www.myfwc.com/wildlifehabitats/managed/manatee.

Frazer, T. K., Notestein, S. K., Hoyer, M. V., Hale, J. A., & Canfield, D. E., Jr. (2001). *Frequency and duration of pulsed salinity events in Kings Bay.* Final report submitted to the Southwest Florida Water Management District (SWFWMD Contract No. 98CON000041). Gainesville: University of Florida.

Frazer, T. K., Notestein, S. K., Jacoby, C. A., Littles, C. J., Keller, S. R., & Swett, R. A. (2006). Effects of storm-induced salinity changes in submersed aquatic vegetation in Kings Bay, Florida [Electronic version]. *Estuaries and Coasts*, *29*, 943-953.

Hartman, D. S. (1974). *Distribution, status, and conservation of the manatee in the United States*. Springfield, VA: National Fish and Wildlife Laboratory to U.S. Fish and Wildlife Service.

Hartman, D. S. (1979). *Ecology and behavior of the manatee (Trichechus manatus) in Florida* (American Society of Mammalogists, Special Publication 5). 153 pp.

Hoyer, M. V., Frazer, T. K., Canfield, D. E., Jr., & Lamb, J. M. (2001). *Vegetation evaluation in Kings Bay/Crystal River* (Final report submitted to the Southwest Florida Water Management District). Gainesville: University of Florida, Institute of Food and Agricultural Sciences.

Husar, S. L. (1978, January 6). *Trichechus manatus. Mammalian Species* (American Society of Mammalogists), *93*, 1-5.

Irvine, A. B., & Campbell, H. W. (1978). Aerial census of the West Indian manatee, *Trichechus manatus*, in the southeastern United States. *Journal of Mammalogy*, *59*, 613-617. http://dx.doi.org/10.2307/1380237

Jones, G. W., Upchurch, S. B., & Champion, K. M. (1998). *Origin of nutrients in ground water discharging from the King's Bay Springs.* Brooksville: Southwest Florida Water Management District.

King, J. M. (2002). *An assessment of manatee behavior as affected by human interactions at two sites in Crystal River, Florida* (Unpublished Master's thesis). Florida International University, Miami.

King, J. M., & Heinen, J. T. (2004). An assessment of the behaviors of overwintering manatees as influenced by interactions with tourists at two sites in central Florida [Electronic version]. *Biological Conservation*, *177*, 227-234. http://dx.doi.org/10.1016/j.biocon.2003.07.001

Kinnaird, M. F. (1985). Aerial census of manatees in northeastern Florida. *Biological Conservation*, *32*, 59-79. http://dx.doi.org/10.1016/0006-3207(85)90065-5

Kochman, H. I., Rathbun, G. B., & Powell, J. A. (1985). Temporal and spatial distribution of manatees in Kings Bay, Crystal River, Florida [Electronic version]. *Journal of Wildlife Management*, *49*, 921-924. http://dx.doi.org/10.2307/3801370

Laist, D. W., & Reynolds III, J. E. (2005). Florida manatees, warm-water refuges, and an uncertain future [Electronic version]. *Coastal Management*, *33*, 279-295. http://dx.doi.org/10.1080/08920750590952018

Langtimm, C. A., Dorazio, R. M., Stith, B. M., & Doyle, T. J. (2011). New aerial survey and hierarchical model to estimate manatee abundance [Electronic version]. *Journal of Wildlife Management*, *75*, 299-312. http://dx.doi.org/10.1002/jwmg.41

Langtimm, C. A., Beck, C. A., Edwards, H. H., Fick-Child, K. J., Ackerman, B. B., Barton, S. L., & Hartley, W. C. (2004). Survival estimates for Florida manatees from the photo-identification of individuals [Electronic version]. *Marine Mammal Science*, *20*, 438-463. http://dx.doi.org/10.1111/j.1748-7692.2004.tb01171.x

Lefebvre, L. W., Ackerman, B. B., Portier, K. M., & Pollock, K. H. (1995). Aerial survey as a technique for estimating trends in manatee population size—Problems and prospects. In T. J. O'Shea, B. B. Ackerman, & H. P. Percival (Eds.), *Population biology of the Florida manatee* (Information and Technology Report 1, pp. 63-74). Washington, DC: U.S. Department of the Interior, National Biological Service. 289 pp.

Marine Mammal Protection Act of 1972, as amended (MMPA) (Title 16 U.S. Code, Section 1361).

Marsh, H., & Sinclair, D. F. (1989). Correcting for visibility bias in strip transect aerial surveys of aquatic fauna [Electronic version]. *Journal of Wildlife Management*, *53*, 1017-1024. http://dx.doi.org/10.2307/3809604

Moore, J. C. (1951). The range of the Florida manatee. *Quarterly Journal of the Florida Academy of Sciences*, *14*(1), 1-19.

O'Shea, T. J. (1988). The past, present and future of manatees in the southeastern United States: Realities, misunderstandings and enigmas. In *Proceedings of the Third Nongame and Endangered Wildlife Symposium* (pp. 184-204). Social Circle: Georgia Department of Natural Resources, Game and Fish Division. 253 pp.

O'Shea, T. J., & Ackerman, B. B. (1995). Population biology of the Florida manatee: An overview. In T. J. O'Shea, B. B. Ackerman, & H. P. Percival (Eds.), *Population biology of the Florida manatee* (Information and Technology Report 1, pp. 280-287). Washington, DC: U.S. Department of the Interior, National Biological Service. 289 pp.

Packard, J. M., Siniff, D. B., & Cornell, J. A. (1986). Use of replicate counts to improve indexes of trends in manatee abundance [Electronic version]. *Wildlife Society Bulletin*, *14*, 265-275.

Packard, J. M., Summers, R. C., & Barnes, L. B. (1985). Variation of visibility bias during aerial surveys of manatees [Electronic version]. *Journal of Wildlife Management*, *49*, 347-351. http://dx.doi.org/10.2307/3801528

Powell, J. A. (1981). The manatee population in Crystal River, Citrus County, Florida. In R. L. Brownell, Jr., & K. Ralls (Eds.), *The West Indian manatee in Florida* (pp. 33-40). Tallahassee: Florida Department of Natural Resources.

Powell, J. A., & Rathbun, G. B. (1984). Distribution and abundance of manatees along the northern coast of the Gulf of Mexico. *Northeast Gulf Science*, *7*, 1-28.

Rathbun, G. B. (1988). Fixed-wing airplane versus helicopter surveys of manatees (*Trichechus manatus*). *Marine Mammal Science*, *4*, 71-75. http://dx.doi.org/10.1111/j.1748-7692.1988tb00185.x

Rathbun, G. B., Reid, J. P., & Carowan, G. (1990). *Distribution and movement patterns of manatees (*Trichechus manatus*) in northwest peninsular Florida*. St. Petersburg: Florida Marine Research Institute. 48 pp.

Rathbun, G. B., Reid, J. P., Bonde, R. K., & Powell, J. A. (1995). Reproduction in free-ranging Florida manatees. In T. J. O'Shea, B. B. Ackerman, & H. F. Percival (Eds.), *Populations biology of the Florida manatee (*Trichechus manatus latirostris*)* (Information and Technology Report 1, pp. 135-156). Washington, DC: U.S. Department of the Interior, National Biological Service, 289 pp.

Reid, J. P., Rathbun, G. B., & Wilcox, J. R. (1991). Distribution patterns of individually identifiable West Indian manatee (*Trichechus manatus*) in Florida. *Marine Mammal Science*, *7*, 180-190. http://dx.doi.org/10.1111/j.1748-7692.1991.tb00564.x

Reynolds III, J. E., & Odell, D. K. (1991). *Manatees and dugongs*. New York: Facts on File.

Reynolds III, J. E., & Wilcox, J. R. (1994). Observations of Florida manatees (*Trichechus manatus latirostris*) around selected power plants in winter. *Marine Mammal Science*, *10*, 163-177. http://dx.doi.org/10.1111/j.1748-7692.1994.tb00258.x

Rosenau, J. C., Faulkner, G. L., Hendry, C. W., Jr., & Hull, R. W. (1977). *Springs of Florida* (Bulletin 31). Tallahassee: Florida Department of Natural Resources, Bureau of Geology. http://dx.doi.org/10.2307/3494475

Runge, M. C., Sanders-Reed, C. A., & Fonnesbeck, C. J. (2007a). A core stochastic population projection model for Florida manatees (*Trichechus manatus latirostris*). *U.S. Geological Survey Open-File Report 2007-1082*. 41 pp.

Runge, M. C., Sanders-Reed, C. A., Langtimm, C. A., & Fonnesbeck, C. J. (2007b). A quantitative threats analysis for the Florida manatee (*Trichechus manatus latirostris*). *U.S. Geological Survey Open-File Report 2007-1086*. 34 pp.

Scott, T. M., Means, G. H., Meegan, R. P., Means, R. C., Upchurch, S. B., Copeland, R. E., . . . Willet, A. (2004). *Springs of Florida*. Tallahassee: Florida Geological Survey.

Shane, S. H. (1981). *Abundance, distribution, and use of power plant effluents by manatees in Brevard County, Florida* (Contract Rep. No. 6155286540 to Florida Power and Light Company; National Technical Information Service, #PB81-147019). Springfield, VA: U.S. Fish and Wildlife Service, National Fish and Wildlife Laboratory.

U.S. Fish and Wildlife Service (USFWS). (2001). *Florida manatee recovery plan (*Trichechus manatus latirostris*)*. Atlanta, GA: USFWS.

USFWS. (2011). *Manatee fact: Native to Florida?* Retrieved 15 January 2014 from www.fws.gov/northflorida/manatee/manatee-native-facts.htm.

USFWS. (2012). *Endangered and threatened wildlife and plants: Establishing a manatee refuge in Kings Bay, Citrus County, FL* (77 FR 15617). Atlanta, GA: USFWS.